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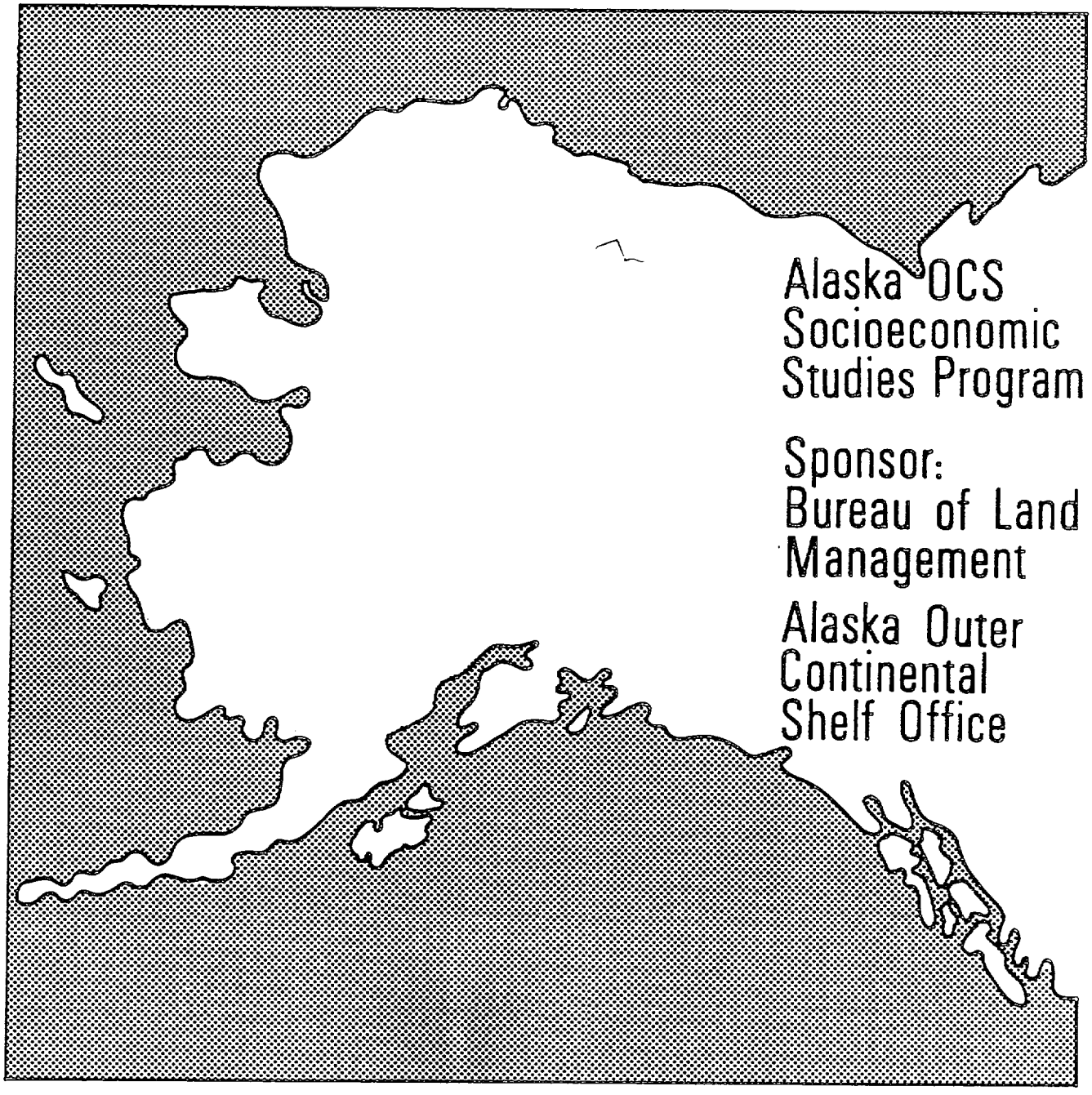

NORTON SOUND/YUKON DELTA SOCIOCULTURAL SYSTEMS BASELINE ANALYSIS

The United States Department of the Interior was designated by the Outer Continental Shelf (OCS) Lands Act of 1953 to carry out the majority of the Act's provisions for administering the mineral leasing and development of offshore areas of the United States under federal jurisdiction. Within the Department, the Bureau of Land Management (BLM) has the responsibility to meet requirements of the National Environmental Policy Act of 1969 (NEPA) as well as other legislation and regulations dealing with the effects of offshore development. In Alaska, unique cultural differences and climatic conditions create a need for developing additional socioeconomic and environmental information to improve OCS decision making at all governmental levels. In fulfillment of its federal responsibilities and with an awareness of these additional information needs, the BLM has initiated several investigative programs, one of which is the Alaska OCS Socioeconomic Studies Program (SESP).

The Alaska OCS Socioeconomic Studies Program is a multi-year research effort which attempts to predict and evaluate the effects of Alaska OCS Petroleum Development upon the physical, social, and economic environments within the state. The overall methodology is divided into three broad research components. The first component identifies an alternative set of assumptions regarding the location, the nature, and the timing of future petroleum events and related activities. In this component, the program takes into account the particular needs of the petroleum industry and projects the human, technological, economic, and environmental offshore and onshore development requirements of the regional petroleum industry.

The second component focuses on data gathering- that identifies those quantifiable and qualifiable facts by which OCS-induced changes can be assessed. The critical community and regional components are identified and evaluated. Current endogenous and exogenous sources of change and functional organization among different sectors of community and regional life are analyzed. Susceptible community relationships, values, activities, and processes also are included.

The third research component focuses on an evaluation of the changes that could occur due to the potential oil and gas development. Impact evaluation concentrates on an analysis of the impacts at the statewide, regional, and local level.

In general, program products are sequentially arranged in accordance with BLM's proposed OCS lease sale schedule, so that information is timely to decisionmaking. Reports are available through the National Technical Information Service, and the BLM has a limited number of copies available through the Alaska OCS Office. Inquiries for information should be directed to: Program Coordinator (COAR), Socioeconomic Studies Program, Alaska OCS Office, P. O. Box 1159, Anchorage, Alaska 99510.

Alaska OCS Socioeconomic Studies Program

Norton Sound/Yukon Delta Sociocultural Systems Baseline Analysis

Technical Report Number 7'2

(AA 851-CT-29)

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and

Socioeconomic Studies Program

Alaska Outer Continental Shelf Office

Bureau of Land Management

October 1981

NOTICE

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Alaska OCS Socioeconomic Studies Program

Prepared by: Robert J. Wolfe

October 1981

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Note on the Use of Past Tense

This report describes fishing, hunting, trapping, gathering, and marketing activities in the Yukon delta region as they occurred during 1980 and 1981, based on observations made during summer 1981, and on verbal reports of residents concerning the period June 1980 to May 1981. Consequently, the report describes "current" economic activities in the Yukon delta region. Scientific standards require that the report be written in "past tense" even though it depicts current realities, for descriptions are of events occurring from several months to about a year ago. Readers should be mindful that unless otherwise stated, past tense implies the period 1980 to 1981, and reflects current conditions in the Yukon delta area during this period.

Abstract of the Reportqs Findings

1. This report describes the economy and culture of' six communities on or near the Yukon River delta--Alakanuk, Emmonak, Kotlik, Mountain Village, Sheldon Point, and Stebbins. It provides basic information necessary for agency decisions about projected petroleum development on the Bering-Norton Outer Continental Shelf'.

2. During 1980-1981, the people of the Yukon delta comprised a strong and growing cultural group because of their success in utilizing local resources of the land, rivers, and sea. In the economy, most production occurred within 'family units"--social groups composed of members of one or several households, typically related by kinship ties. The male head of a household commonly was self-employed in several roles, as fisherman, hunter, trapper, and seasonal wage earner. Harvests of local food resources were processed for personal use by the members of the family units, exchanged locally, and sold on export markets. Food production for personal consumption was flexible and diversified, harvesting in substantial quantities salmon, herring, sheefish, Bering cisco, broad whitefish, blackfish, bearded seal, ringed seal, spotted seal, belukha, migratory waterfowl, and walrus. The largest and most consistent source of monetary income to the region was the sale of commercial salmon.

3. During the period June 1980 to May 1981, it was estimated that a household produced 4,S97 pounds dressed weight of subsistence foods, or 783 pounds per household member. The value of this food was calculated to be $21,238, more than the earned monetary income per household in the Yukon delta area. The estimates were based on a 20 percent sample of households in the study area.

4. During the period June 1980 to May 1981, it was estimated that a household produced 10,447 pounds of commercial salmon, sold at a value of $8,026. Commercial fish harvests represented about 41.5 percent of a household% total earned monetary income, while 40.7 percent came from wage employment, 5.7 percent from the commercial sale of furs, and 2.6 percent from retirement and social security benefits. Of a household's total monetary income, ˙90.5 percent was earned; 9.5 percent came from food stamps and other forms of income assistance. Annual earned income was estimated at $17,512 per household.

5. The 'subsistenc$_e$ and "market" sectors of the economy appeared to be interdependent and mutually supportive. Neither sector alone could sustain the region's population. A household's success in one sector typically facilitated success in the other.

6. Collectively, the fishing and hunting activities of the six communities in the study area covered the entire Yukon delta region. Several important economic resources were harvested directly from or near to ocean waters--king, chum, and coho salmon; herring;

bearded, ringed, and spotted seal; belukha; saffron cod; sheefish; Bering cisco; broad whitefish; blackfish; walrus; and migratory waterfowl. Changes in the region's oceanic, riverine, and coastal tundra environment could be expected to have direct and immediate effects upon the major economic activities of the region.

7. The settlement pattern of the Yukon delta area changed markedly between winter and summer. During winter, households clustered at six major winter communities, from which persons traveled to fish, hunt, and trap. About half of the communities' households moved to fishing camps during the summer of' 1981, widely dispersed throughout the region. Temporary camps were established during winter, spring, and fall by some individuals as bases for fishing, hunting, trapping, and plant gathering activities.

8. Production of food within family units commonly was accomplished by allocating particular tasks according to age and sex criteria. Most fishing, hunting, and trapping was accomplished by males; most processing of food products for storage and use was done by females, Total food output by males-was highest between the ages 30 to 59; age-specific output patterns varied by resource. Older adults commonly assumed leadership roles; children and young adults contributed labor in a number of support activities. Modifications in the region% economy might be expected to influence the pattern of economic activities within these kinship-related units .

9. Two Yupik terminological systems for kinship reckoning were used by Yukon delta residents during 1980 to 1981. Both were based on bilateral descent, and made fine distinctions among siblings by age and sex. One system used the classic "Eskimo-type" cousin terminology; the other system resembled the 'Iroquois-type" cousin terminology.

10. Exchange of local food products was substantial between households and between persons of different communities. A major food item exchanged from coastal communities to main river communities was seal oil.

11. Resource utilization revealed distinct geographic patterns which varied by species. Cultural concepts of land and sea use tentatively were advanced to explain these spatial trends.

12. The majority of Yukon delta residents expressed deep concern about projected offshore petroleum development. Issues identified by residents included:

    a. The substantial threats to the regional economy posed by petroleum development, due to environmental degradation and increased inflation rates.

    b. The inadequate knowledge and technology of oil developers, especially related to ocean ice conditions, flooding, ocean currents, and oil cleanup.

c. The risks assumed by the region without benefits from oil development.

d. The negative acculturative impacts of uncontrolled contact of outside workers with local communities.

e. The question whether oil development in Norton Basin threatened the very cultural survival of the Yukon delta people.

INTRODUCTION

Description of the Study

This report is a baseline description of the economy and culture of the people of the Yukon River delta as they existed during 1980-1981. Its information was compiled from 12 weeks of field-based studies conducted over the Yukon delta during the summer of 1981. These studies were undertaken to provide basic information about the economy and culture of the Yukon delta people considered necessary for agency policy decisions regarding projected petroleum development on the Bering-Norton Outer Continental Shelf. The research was subcontracted through the Subsistence Division, Alaska Department of Fish and Game, from funding provided by the Bureau of Land Management, Alaska Outer Continental Shelf Office (OCS), Socioeconomic Studies program.

Background

The Norton Sound/Yukon Delta Sociocultural Systems Baseline Analysis was initiated in response to projected petroleum development in Norton Basin. In response to Federal Outer Continental Shelf Sale 57 comprising Norton Basin being placed on a lease schedule anticipated to occur in May 1982, the Alaska OCS Office provided funding for a study of the impact of petroleum development on sociocultural systems within

the Bering Strait-Norton Sound vicinity (published as Bering-Norton Petroleum Development Scenarios, Sociocultural Systems Analysis, Ellanna, April 30, 1980). It was originally anticipated by the Alaska OCS Office that oil development and its impacts would be centered primarily in Bering Strait and northern Norton Sound, especially within the vicinity of Nome. The major funded study of the impact of sociocultural systems was designed to focus on these areas (Ellanna, 1980).

There were several sources of concern that too much emphasis was placed on Bering Strait and northern Norton Sound in the original scope of this study, and oil development might occur in the southern Norton Sound area, close to the Yukon River delta. The Yukon delta area therefore was hastily added to the scope of this intial sociocultural impact study. However, time and funds allowed field visits of' minimal duration to four of the six communities in the Yukon delta vicinity identified as having the highest potential for impacts. This amount of research effort was insufficient for an adequate description and analysis of such a large geographic and demographic area.

This present study was funded to provide information on the economy and sociocultural systems of the Yukon delta population which was unavailable previously. The study is not an impact analysis per se. Instead, it was developed to gather basic descriptive information on the Yukon delta region which might be useful in further research and

discussion concerning the impacts of petroleum development on the region's sociocultural systems.

Purpose of the Study

The purpose of the Norton Sound/Yukon Delta Sociocultural Systems Baseline Analysis was to provide a description of the economy and culture of the people of the Yukon River delta as they existed in 1980-81. The communities included within the study were Alakanuk, Emmonak, Kotlik, Mountain Village, Sheldon Point, and Stebbins, and the seasonal communities of Hamilton and Bill Moore Slough. The population of these communities were about 91 percent Alaska native. Specific research objectives included:

1. identification and mapping of general settlement patterns;
2. description of the economic patterns of the population;
3. identification and mapping of general resource utilization patterns;
4. description of the annual seasonal round of resource utilization;
5. description of household subsistence patterns;
6. description of economic networks for production and exchange;
7. description of fishcamp compositions;
8. description of the monetary components of fishing, hunting, and marketing activities;
9. description of the regional kinship systems; and
10. identification of issues pertaining to land, sea, and resource allocation, use, and disruptions.

This information was considered basic to understanding the sociocultural systems of the people of the Yukon delta area.

Methodology

The study was conducted by Robert J. Wolfe, Ph.D., from the University of Southern California, with assistance from Linda Ellanna, Subsistence Division of the Alaska Department of Fish and Game, and bilingual research assistants within each of the study communities. The study comprised first, a literature review of published and unpublished information pertaining to the Yukon delta vicinity, and second, field research within each of the six study communities. The literature review was conducted during the months of April 1981 to May 1981. The field research was conducted from May 20, 1981 to August 13, 1981.

Previous to the field research component, the native regional corporations of Nunam Kitlutsisti and the Association of Village Council Presidents were contacted and consulted concerning the nature and intent of the study. Information concerning the project was disseminated to the IRA Councils and Corporations of each of the Yukon delta communities. Prior to initiation of data collecting within each community, representatives of the IRA Councils and Corporations were contacted and consulted. In addition, the researcher and the project were introduced to community representatives at public meetings in Emmonak, May 31; Kotlik, June 1; and St. Mary's, June 2.

The field design called for visits to each delta community and to summer fishcamps during the summer of 1981 to gather pertinent information. Stebbins and Mountain Village were visited by plane because of distances, but travel between the communities of Kotlik, Emmonak, Alakanuk, and Sheldon Point was conducted primarily by boat. The researcher generally established a base camp at the winter community, traveling to surrounding areas with a research assistant familiar with the people and fishcamps located within the vicinity.

Data were gathered through a combination of participant observation techniques, and in-depth, systematic conversations with residents. Participant observation entailed participating in culturally significant activities, such as salmon fishing, waterfowl hunting, gathering plants, preparing meals, and processing food. Qualitative observations were made from these activities. In-depth, systematic conversations entailed discussions with knowledgeable residents concerning the communities' economy and culture, and issues related to offshore petroleum development in Norton Sound.

The study attempted to generate quantitative and graphic data on fishing, hunting, and marketing activities as well. This component of the study was conducted in the following manner. Systematic information was desired from a 20 percent sampling of household in the region. A household was defined as a group of people residing in a separate dwelling at the winter community. A list of households was developed from a knowledgeable resident for the winter community, identified by

the name of the household% head. The researcher indicated that he was interested in learning about fishing, hunting, and other aspects of the economy; to do so, which household heads should he speak with? Knowledgeable assistants indicated which household heads were believed would be fruitful to contact. Apparently, many persons so indicated were actively involved in fishing and hunting; others were not presently involved, but were thought to be knowledgeable about them (such as elderly persons). The researcher attempted to contact and speak with each of the households indicated. Additional households visited were net selected by any deliberate systematic criteria, thereby comprising a sample of convenience. Following this strategy, 88 households were contacted for systematic discussion comprising a 20.7 percent sample of the region's identified households (see Chapter 4).

The procedure for selecting the sample of households cautions about making generalizations from the systematic, quantitative information. If a sample bias was injected by the sampling procedure, probably it was toward selecting older, more knowledgeable and/or more economically successful household heads in a community in comparison with those not selected. For certain ethnographic purposes this bias is beneficial. To document the breadth or extent of land and resource use in the region, a research design would want to draw information from more knowledgeable persons over less knowledgeable persons, and from more actively involved persons over less actively involved. Possibly, an older, more knowledgeable and more active sample facilitates this research goal. However, the possible selection bias does not produce

information representing (1) some 'mean" or "average" household use pattern or harvest level, for the entire region, or (2) some 'total" or "summary" use pattern or harvest level for the entire region. The systematic, quantitative data of this report should not be used to represent average or summary harvest patterns for the six communities or Yukon delta region. To achieve 'average" or 'total" data, a complete canvass of households could be done, preferably over several years to control for the effects of normal and abnormal yearly variations in a household's production levels. A complete survey of households is feasible only during winter months when houeholds tend to cluster at winter communities.

When interpreting quantitative data in Chapter 4, mean household harvests within a community should be taken to represent mean household harvests for the sample, which may have the biases mentioned above. It is noteworthy that of the 88 households, 71.6 percent had at least one household member working for some part of the year at a wage paying job other than commercial salmon fishing or commercial fur trapping. This probably is an overestimate of the percentage of households in the Yukon delta area with members working at remunerative employment, resulting in an overestimate of the yearly monetary income per household for the area. That is, this sample of household members may have been more involved in wage paying employment than non-sampled household members in the region. At the same time, the harvests of resources for personal consumption and local trade by sampled households also may be greater than non-sampled households. Without data for other

households, however, the extent of these possible differences cannot be estimated. Until such data is forthcoming, generalizations from the sample must be tentative and qualified.

Households were visited with the local research assistant. Preferably, discussions occurred with both the household head and spouse present, if there was a spouse. In the course of discussion, they were questioned concerning the types and quantities of food resources harvested the previous year. Fishing and hunting locations of these activities were noted on 1:63,000 USGS topographical maps. Compiled, these data became the basis for the maps in Chapter 3, and the quantitative estimates of food production in Chapter 4. For additional information on this methodology consult Wolfe (1979).

The maps of fishcamp locations were compiled differently. Several knowledgeable informants were asked to indicate on the 1:63,000 USGS topographical maps the current locations of the summer fishcamps of the list of household heads. From the answers of several persons, a consensus was generally reached. Many of these locations were confirmed from field visits to these camps by the researcher. The majority, however, have not been confirmed by field visits. Consequently, these locations should be considered approximate only, useful for depicting general tendencies in summer demographic patterns.

Fishcamp visits and discussions with families returned from fishcamps included the gathering of information on the genealogical composition of

the fishcamp group. This became a basis for discussion concerning principles of social organization.

Kinship terminologies were elicited from key informants within each community. The methodology is described in Leaf (1972).

In addition to participant observation of, and in-depth conversations about, economic and sociocultural systems, residents were asked their opinions about petroleum development in Norton Basin. These unstructured discussions comprised the basis for the identification of issues pertaining to land, sea, and resource allocation, use, and disruptions.

Organization of the Report

The report is organized into nine chapters. The first chapter describes the general characteristics of the study area, and provides a brief history of the region% population. Chapter 2 describes the settlement patterns in 1980-1981 within the region, depicting the locations and compositions of winter communities, summer fishcamps, and fall, winter and spring camps. Chapter 3 provides an overall description of the regional economy in general terms. This includes the annual round of economic activities, commerical marketing and wage employment, and geographic patterning of resource utilization. Chapter 4 provides quantitative estimates of the types and quantity of resources produced by a sample of households from each community during June 1980 to May

1981. Some sociocultural aspects of the economy are presented in the next four chapters. Chapters 5 and 6 describe the region's kinship system and the organization of summer fishcamps. Chapter 7 discusses the sharing and exchange of food resources. Chapter 8 provides a tentative discussion of cultural concepts regarding resource utilization, The final Chapter 9 identifies issues in the Yukon delta region associated with petroleum development in Norton Basin.

CHAPTER 1

THE PEOPLE OF THE YUKON DELTA REGION

The Yukon Delta Study Area

The communities of this research effort were identified primarily because of their geographic proximity to the projected petroleum development in Norton Basin. The communities studied included Alakanuk, Emmonak, Kotlik, Mountain Village, Sheldon Point, Stebbins, and the seasonally occupied communities of Hamilton and Bill Moore Slough. As is evident in Figure 1, all these settlements except Mountain Village were on or near the coast of Bering Sea or Norton Sound. Mountain Village lay about 87 miles inland along the Yukon River. It was included with the coastal communities primarily because its economic base was suspected to be similar to those of the coastal settlements, and because of its socioeconomic relationships with the coast. These six winter communities, and the area between, defined the Yukon delta study area, as used herein. Other than these criteria above, the boundary of the study area was somewhat arbitrary, reflecting time and funding criteria. In reality, other communities along the Yukon River and the coast south of the study area were part of a regional pattern, or economic and cultural continuum, and could have been included in the study area because of their economic and cultural similarities.

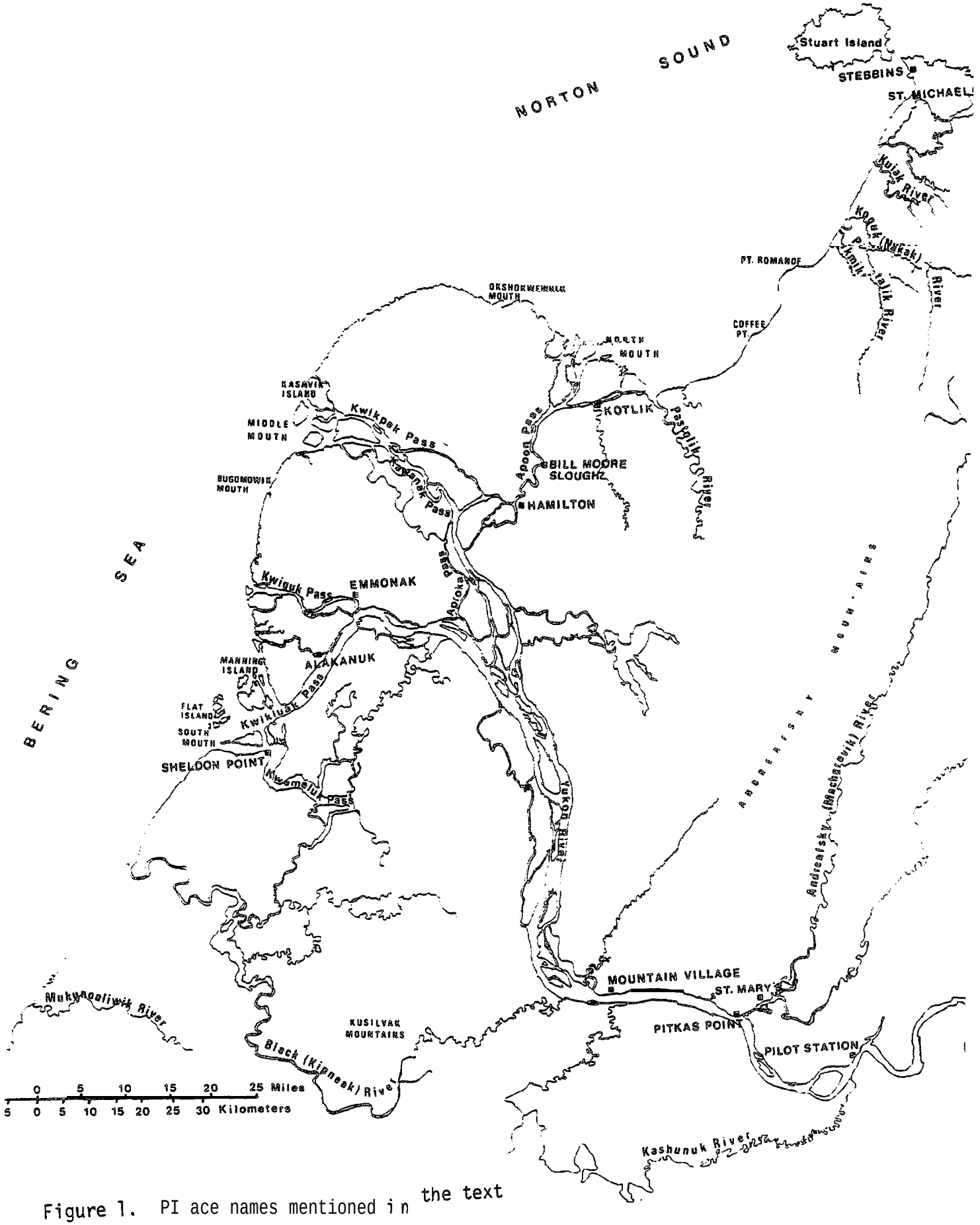


Figure 1. PI ace names mentioned i n the text

This chapter outlines some of the environmental and cultural characteristics of this grouping of six communities. It will be shown that the people of the Yukon delta study area shared more than geographic propinquity. The people of the lower Yukon delta were integrated by a common ecology and cultural tradition. Currently, the populations of these communities were about 91 percent Alaska Native. The Alaska Natives of all the communities except Stebbins belonged to a larger culturally defined regional group, the Kwikpagmiut. Stebbins was linked to this regional group economically and socially. To understand the current economy and culture of the people of the region, one must know something of the people's ecology and cultural history.

Environmental Setting

The study area predominantly comprises a low and flat alluvial deposit of the Yukon River mouth, bordered to the north and east by a volcanic mountain range. The Yukon River divides into three main passes before meeting the ocean: the south Kwikluak Pass, the middle Kwikpak Pass, and the north Apoon Pass. The land between the south and north passes rises only a few feet above sea level. South of Kwikluak Pass, the land elevates to about 30 to 70 feet, and is punctuated by a few volcanic hills and mountains. The delta is a wide expanse of meandering waterways and innumerable lakes, the interstitial land comprise of tundra, scrub, grass, low willows, and alders. Hills front the north bank of the Yukon River at Mountain Village. The low hills are carpeted with tundra and stands of spruce, birch, aspen, alders, and

willows. The hills increase to elevations of 2,500 feet, becoming the Andreafsky Range separating the Yukon River from Norton Sound. One spur of these mountains enters the waters of Norton Sound at St. Michael and Stuart Island, the location of' Stebbins. Unlike the delta, this sector is characterized by volcanic hills, steep cliffs, and rocky beaches, cut by rivers draining into Norton Sound, and covered by tundra, grasses, and willows.

The Eskimoan biotic province encompasses most of the region, except for the eastern edge, which enters the Hudsonian. From May through September, mean Fahrenheit temperatures range in the 40's and 50's, with highs in the 70% and lows in the mid-20's. After September, temperatures fall rapidly, so that from December through March mean temperatures range from about 20 to minus 5 degrees, with lows in the minus 20's and 30's. Ice covers the Yukon River and the coastal waters from about late October to middle May. During fall, winter, and spring the region becomes a frozen flatland traveled by snowmachine and sled. In summer, the rivers become the major arteries for travel by boat.

The region is rich in fish and game resources. Except for caribou since the middle 1800's and beaver for a discrete period during the historic fur trade, the area apparently has suffered no significant declines in resource population levels. The same local resources that sustained the people historically still sustained the people today (see Wolfe, 1979).

The major fish species include king, chum, silver, red, and pink salmon; humpback, round, and broadnosed whitefish; sheefish (inconnu); burbot; blackfish; saffron cod; Bering cisco; northern pike; grayling; lamprey; and varieties of smelt and sticklebacks. At Stebbins, Pacific herring, starry flounder, and sculpin are common species. The immediate coast is visited by bearded, ringed, and spotted seals; belukhas; and a few walrus and sea lions. Moose inhabit upriver sloughs and grasslands, and small caribou herds range the Andreafsky Mountains.

Mink, arctic and red fox, muskrat, tundra and snowshoe hares, and land otter inhabit lowlying areas. There are beaver, arctic ground squirrel, wolverine, grey wolf, lynx, black bear, porcupine, weasel, and marmot in wooded regions. Migratory waterfowl include Canada white-fronted, emperor, and snow geese; black brant; and a variety of duck species, such as mallard, American widgeon, pintail, green-winged common teal, greater scamp, and old squaw. Ptarmigan and willow grouse are permanent residents.

Cultural Groups in the Study Area

The people of the lower Yukon River during 1980-1981 called themselves Kwikpagmiut--"people of the big river." This was an explicit statement concerning the major unifying aspect of their society, the riverine environment that shaped large portions of their lives. The Kwikpagmiut represented a Western Yu'pik Eskimo society. Kwikpagmiut was a 'regional designation," sometimes referred to as a "tribe" in the

anthropological literature (Oswalt, 1967: Ray, 1964). Historically, and during 1980-1981, the Eskimos who called themselves Kwikpagmiut lived along the Yukon River from Paimiut to the Bering Sea (Figure 2). The Kwikpagmiut were living in the region at historic contact, circa AD 1833 (Zagoskin, 1833). Archeological research traces the continuity of the Western Alaskan people for several thousand years.

Historically, the people of Stebbins called themselves Tapraqmiut, and were not part of the Kwikpagmiut cultural group. It is not clear what regional designation the Tapraqmiut had at historic contact. The majority of its present population, however, traced their ancestry to the people of Nelson Island, south of the Kwikpagmiut region. Near the turn of the present century, Nelson Island people frequently traveled to St. Michael for trade and other economic opportunities. Many of these people established residence with the Tapraqmiut. Thus, although residing along southern Norton Sound, the people's cultural affiliations lay to the south.

Historic Demography

The Kwikpagmiut historically comprised a large society relative to other Eskimo groups. Their population at historic contact has been estimated at about 1,780 persons (Wolfe, 1979). Since contact, the region's population has been struck by several severe epidemics, smallpox 1838 and 1839, measles and influenza 1900, influenza 1919, and tuberculosis circa 1940. Despite high mortalities the population

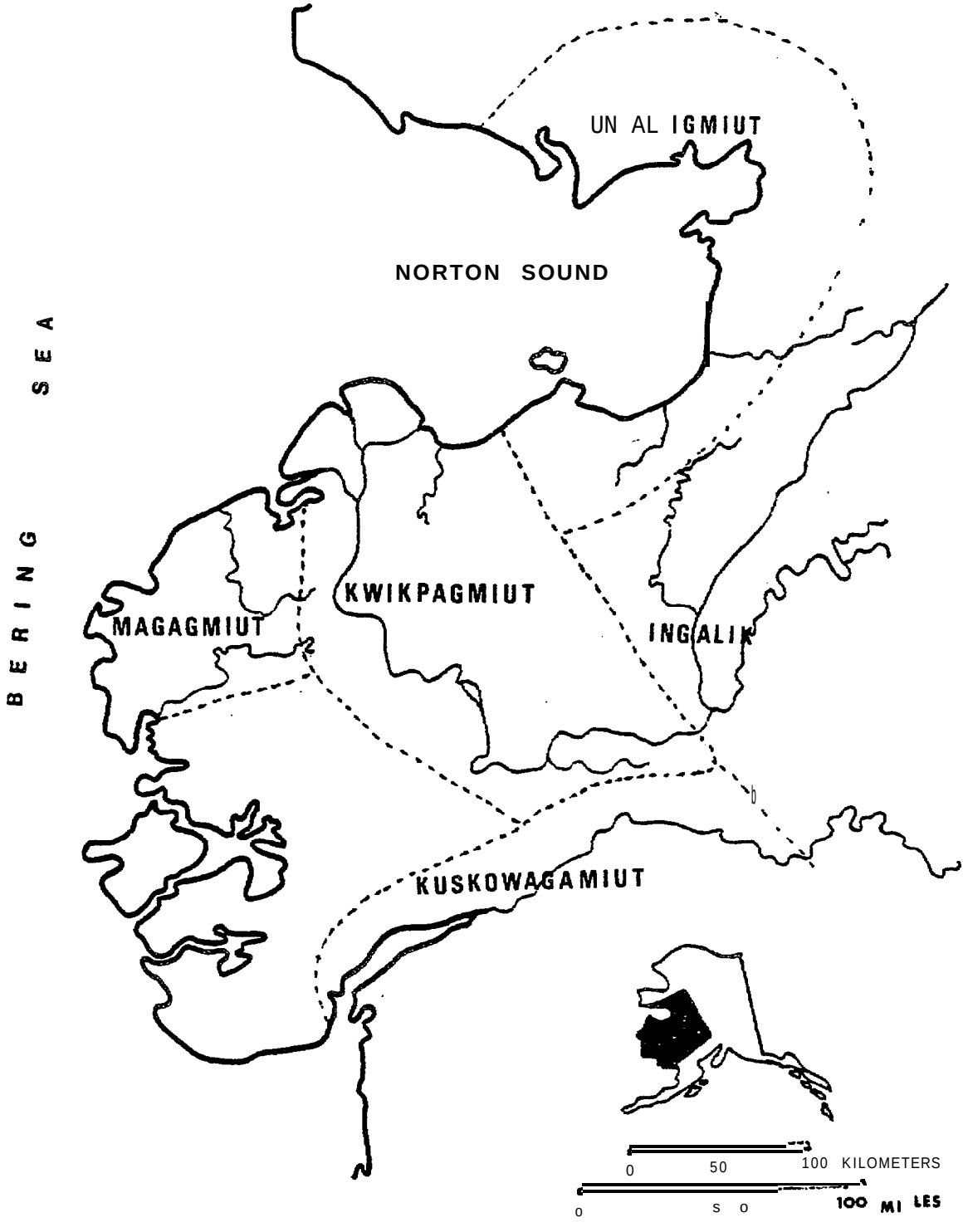


Figure 2. Historic regional groups in the Yukon delta area, circa A.D. 1933

endured and grew, currently exceeding its estimated aboriginal levels. In 1980 the Kwikpagmiut population was estimated to number 2,972 persons (3,288 including Stebbins). The total population of the region was 3,206 (3,537 including Stebbins). The sustained population levels despite biological pressures is evidence of the cultural group's historic vitality and adaptability.

Historic population trends are complicated by changes in settlement patterns within the region. Since the turn of the present century, the Kwikpagmiut have absorbed part of another regional group to the south, called the Magagmiut, "people of the tundra flats." Magagmiut communities dotted the low region between Kwikluak Pass on the north, and the Mukunoaliwik and Kashunuk Rivers on the south. The Magagmiut historically resided in dozens of small winter settlements rarely larger than three or four households. The spatially dispersed Magagmiut consolidated about schools established at places like Akulurak and Nunaqaq (New Knock Hock) after about 1895. Eventually, part of the Magagmiut population merged with the Kwikpagmiut at Alakanuk, Emmonak, Mountain Village, and other contemporary settlements. Despite these movements the lands and waters of the Magagmiut still were being fished and hunted in the 1980's by the residents of Kiwkpagmiut winter villages. Thus, in terms of geography, the Kwikpagmiut region covered the area between the Mukunoaliwik and Kashunuk Rivers on the south, the Pastolik River on the north, and upriver to Paimiut Slough, including the surrounding mountains and tundra.

Historic Economy and Culture

The Kwikpagmiut economy and culture have demonstrated a perduring stability throughout the historic period, dating about AD 1833. Historically as today, the economy comprised a flexible pattern of fishing, hunting, and marketing activities. The Kwikpagmiut's primary food resources, king and chum salmon, locally supplemented with seal, belukha, waterfowl, Bering cisco, sheefish, broad whitefish, and other fish species, historically were harvested for local consumption and market sale. Before and after historic contact, the Kwikpagmiut participated in the Western Alaskan trade network for furs, caribou skins, fish, and other products, which linked markets in Siberia and Alaska (traditional marketing activities are referred to as "barter" by some historians). " Traditionally, local markets also existed. Profitable export markets for salmon, and at times for furs, have developed outside the region, stimulating an expansion of fishing and hunting for market sale for these products since historic contact. In this region, commercial salmon fishing and fur trapping have not replaced fishing, hunting, or trapping for personal consumption and local trade, but have become integrated within the regional economic system. As is shown in subsequent chapters, the "commercial" and "subsistence" sectors of the economy are, in general, complementary and mutually supportive (see Wolfe, 1979).

Largely because of the rich and stable fish and game resource base, the Kwikpagmiut have maintained themselves as a culturally strong and

self-sufficient group. Most Kwikpagmiut households during 1980-1981, as in the past, subsisted from a mixed pattern of economic activities. Households harvested substantial quantities of' local fish and game resources. A portion was processed and retained for personal consumption and local exchange; the remainder was sold on external markets for monetary income. Cash income allowed for the purchase of imported fishing and hunting technology, such as fish nets, boat motors, and snowmachines, as well as other material products which supported economic production and the region% way of life. Historically, the Kwikpagmiut have successfully adapted their mixed subsistence and mar. ket economy to the economic and social conditions of the modern era (Wolfe, 1 979).

The cultural continuities and economic viability of the historic Kwikpagmiut culture is somewhat remarkable in comparison with the experiences of other Native American groups. In the face of substantial social and economic changes, the Kwikpagmiut have created an enduring and growing society and culture. Subsequent chapters descibe aspects of the region% economy and culture as it existed in 1980-1981.

CHAPTER 2

SETTLEMENT PATTERNS IN 1980-1981

The demographic patterning of the Yukon delta population in 1980-1981 could be described as a dynamic movement within seasonal configurations. Families of the Yukon delta study area generally consolidated into six main communities (locally termed "villages") during winter. These communities served as bases for winter activities that frequently ranged many miles from the home settlements. During summer families frequently dispersed and reorganized into a number of smaller settlements (called 'summer camps," or "fishcamps") stretched along the banks of the region's rivers, sloughs, and distributaries. At times during fall, winter, and spring, families or hunting groups in addition might reside days or weeks at camps generally established inland, away from the main river. The size, composition, and location of living sites showed seasonal, and at times daily variation, with winter villages showing the most stable conformation and fall and spring camps the least stable. Many individuals were highly mobile between alternative dwelling places, especially during summer months. Consequently, the demographic patterning of the regional population best viewed as a dynamic flux of persons between places, rather than as a relatively static structure. This chapter presents some general characteristics of these regional settlement patterns and describes summer fishcamps in

some detail. A description of subsistence activities occurring at seasonal settlements is presented in subsequent chapters.

Winter Communities

In 1980 there were six main communities within the Yukon delta study area, occupied by some individuals the entire year, and by others during fall, winter, and spring. The populations of these communities, according to the 1980 census, is presented in Table 1. The greatest concentration of winter population was along or near the Kwikluak Pass. Three winter communities were located in this area of the delta--Emmonak along Kwiguk Pass, Alakanuk along Alakanuk Pass, and Sheldon Point along Kwemeluk Pass. Collectively they comprise 49.7 percent of the population of the six study villages. The high concentration of persons in this sector of the delta probably resulted from two factors. First, on normal years the bulk of the Yukon River salmon runs entered through the south mouth. Individuals living near the south mouth were afforded first opportunity to harvest the salmon runs. Second, since the turn of the century commercial fishing buyers and processors typically have located in this area, attracting participants in the commercial salmon fisheries.

By contrast, the middle and north passes currently supported a single winter community Kotlik, near the north Apoon Pass, with a population of 293. Two other incorporated areas, Hamilton and Bill Moore Slough, also lay in this sector of the delta. The population of these two

TABLE 1

1980 POPULATIONS OF STUDY COMMUNITIES

OF THE YUKON DELTA REGION*

Community	Alaska Native Population	Non-Native Population	Total Population	Percent Alaska Native
Alakanuk	491	31	522	94.1
Emmonak	517	50	567	91.2
Kotlik	280	13	293	95.7
Mountain Village	539	44	583	92.5
Sheldon Point	98	5	103	95.1
Stebbins	316	15	331	95.5
Combined Communities	2,241	158	2,399	93.4

*Source: 1980 United States Census.

settlements fluctuated seasonally, most families choosing to reside at Kotlik during winter to be near educational and retail facilities. Approximately 37 miles separated Kotlik from the nearest south pass community, Emmonak, a two-hour trip by boat or snowmachine.

The winter community of Stebbins lay about 50 miles northeast of Kotlik on the coast of St. Michael Island along southern Norton Sound. Supporting a 1980 population of 331, Stebbins participated in summer fishing activities on or near the north mouth of the Yukon River, and maintained trade and ceremonial relations with the community of Kotlik.

Upriver from the south mouth, about 48 miles, the three passes of the Yukon delta diverged from a single main channel. Along the Yukon River channel, between 87 and 213 miles from the coast, were six winter communities within the Kwikpagmiut cultural region--Mountain Village, Pitkas Point, St. Mary's-Andreafsky, Pilot Station, Marshall (Fortuna Ledge), and Russian Mission. Of these, Mountain Village was included as part of this present study. Mountain Village was a relatively large community, supporting a 1980 population of 583 individuals.

The winter communities served as centers for certain political, economic, educational, and ceremonial activities for the region's population. All six winter communities were incorporated as second class cities with municipal governments. Paralleling city governmental structures, most communities contained Alaska Native corporations created since the Alaska Native Claims Settlement Act (ANCSA) of 1971,

and councils established by the Indian Reorganization Act. Authority over local concerns such as land ownership, public services, housing development, and business were allocated among the governmental bodies, the pattern of allocation differing among communities. The Native corporations pursuant to ANCSA were entitled to become holders and managers of selected tracts of federal land surrounding the winter communities. As of the summer of 1981, all six communities were still involved in the conveyance process.

The winter communities contained usually one or two retail stores, the main source of imported food and material products to the region's population. Even when families dispersed for seasonal hunting and fishing activities, they frequently returned to the winter community to purchase supplies. Most seasonal remunerative employment other than salmon fishing also was centered at winter communities. Participation in wage employment frequently influenced a household% seasonal movements, generally requiring the household to maintain frequent contacts with the winter community.

Most of the winter communities possessed public educational facilities offering education or training from preschool through high school. Mandatory public education was the primary reason for the historic consolidation of families into large settlements. Currently, families maintained residence at the winter village from September through May so that children could attend school. During this time most religious and ceremonial activity also occurred in the community. Religious

services and traditional. dances and potlatches frequently stimulated intervillage visiting and exchanges during winter.

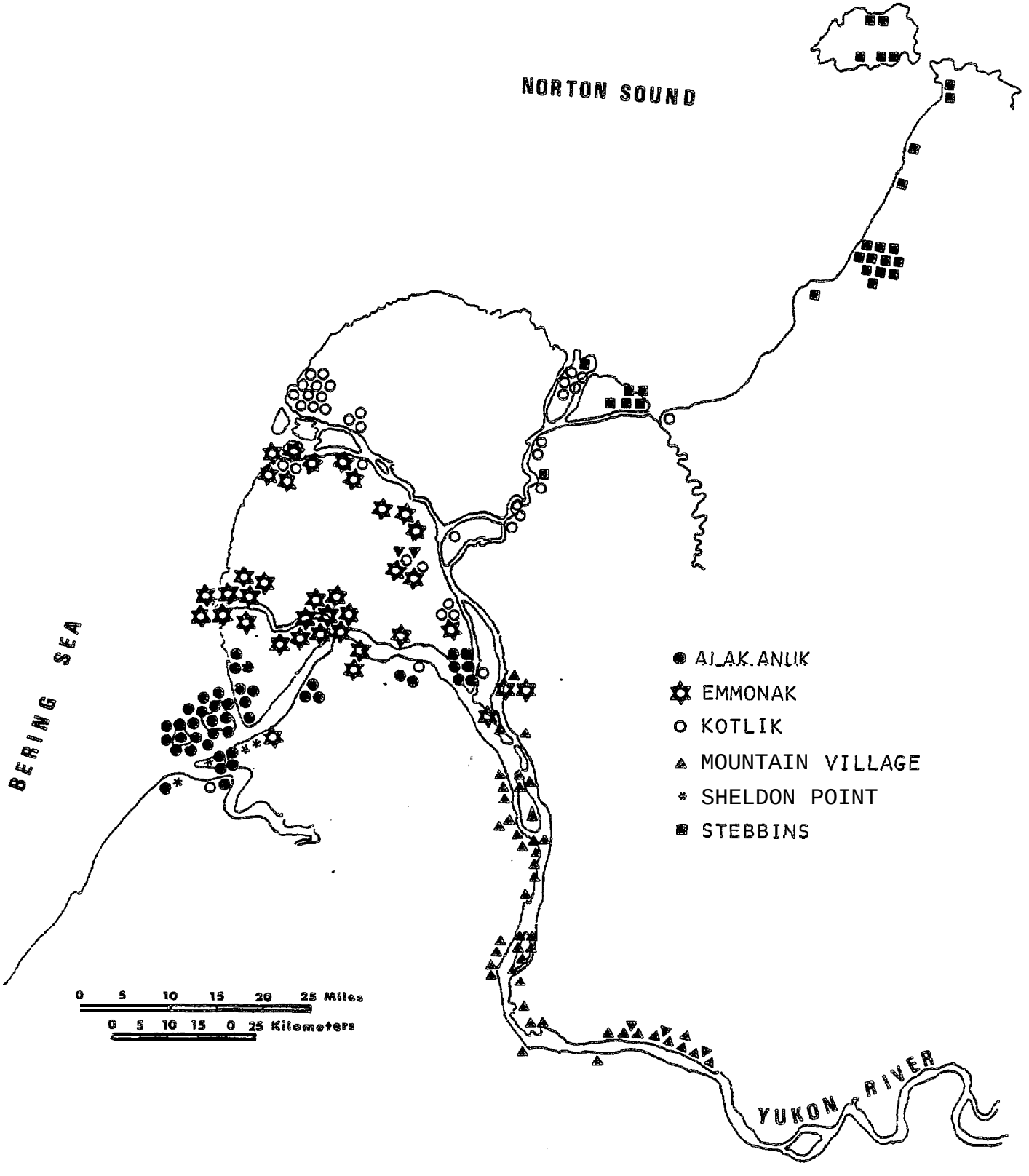
The winter communities served as bases for a number of' fishing and hunting activities. As will be discussed in subsequent chapters, households frequently maintained nets and traps close to the community for non-salmon fish species during fall, winter, and spring. Hunting forays by snowmachine for fur bearers, other land mammals, and birds regularly were conducted from the winter community. About half of the households in the region used the winter village as a base for summer salmon fishing activities during 1980-1981. In these cases, the household maintained cutting areas, drying racks, and smokehouses in the village, usually located close to the river% edge. Drifting and setting nets for salmon might take place some distance from the village, and the fish brought back for processing after each open fishing period.

Summer Fishcamps

Following the breakup of Yukon River ice, usually near the end of May or during early June, the settlement patterning of the Yukon delta population changed. Many individuals and families disengaged from the winter community, traveled to other areas of the delta, and reorganized at locations called "fishcamps," or simply, "camps." The process resulted in a more dispersed and fluid demographic configuration on the delta, generally persisting from June through August. The extent of

dispersion can be seen in Figure 3, which depicts approximate locations for households during the summer of 1981. (Chapter 1 provides a discussion of the methodology used in map construction). As illustrated in Figure 3, the areas surrounding most main passes and distributaries of the delta became populated by individuals, families, or clusters of families. The delta changed from a region seemingly devoid of habitations to one filled with small settlements. As is discussed in subsequent chapters, the major purpose of this movement was to increase an individual's or family's effectiveness in harvesting salmon.

Figure 3 depicts locations where persons or families resided for some period of time during summer, 1981. As movement by persons between camps and winter villages was substantial, the fixed, static appearance of the map is somewhat deceiving. Typically, a visit to a fishcamp on any particular day would find certain individuals present and in residence, other individuals present but considered to be only visiting, and other persons missing, considered in residence, but temporarily out checking nets, gathering firewood, visiting, and so forth. At times, especially during the weekly closed fishing periods, a fishcamp would empty--becoming a cluster of tents, racks, and smokehouses without people--while the residents would visit the winter village to obtain supplies and socialize until the next open period. Additionally, some people occupied fishcamps for only part of the summer, while others established fishcamps at two or more sites during the summer. Thus, the geographic arrangement of fishcamps in Figure 3 is not a static



APPROXIMATE LOCATIONS OF SUMMER FISHCAMPS OF HOUSEHOLDS FROM ALAKANUK, EMMONAK, KOTLIK, MOUNTAIN VILLAGE, SHELDON POINT, AND STEBBINS IN 1981

structure, but represents a configuration within which people frequently engaged in mobile forms of activity.

Some geographic trends can be noted in Figure 3 in the choice of fishcamp locations by persons. The fishcamp locations of Mountain Village people stretched from about Pilot Station downriver to the head of the three major Yukon passes. Alakanuk residents tended to locate fishcamps near the mouth of Kwikluak Pass, especially on Manning Island and Flat Island. Kotlik residents located fishcamps along Apoon Pass and Kwikpak Pass, with a large cluster at the middle mouth on Kasavik Island. Emmonak residents chose fishcamp sites intermediary between Alakanuk and Kotlik fishcamps, especially along the Kwiguk Pass and the southern shore of Kawanak Pass. Seven households from Stebbins (those with commercial salmon permits) located fishcamps near the north pass, while most of the remainder were placed along the southern shore of Norton Sound, especially near the Pikmiktalik River. Sheldon Point people by and large fished from the winter village. People from several villages located fishcamps together at a few places, such as at the head of passes, and at Acres Camp near Aproka Pass.

The significance of these areas occupied by persons from particular winter villages is discussed in Chapter 80 It can be mentioned here that these geographic areas probably do not represent village fishing territories.n Kwikpagmiut fishermen ordinarily did not utilize concepts like ownership, control, and defense of land or water in the selection and maintenance of fishcamps. The fishing areas seemingly

associated with particular villages are more properly understood to be "use areas," the shape developing over time from the operation of several factors, such as distance from winter villages, location of fish buyers, kinship affiliation, and conscientious regard for the rightful priorities of pre-existing users of a resource area.

It may be noted in this context that the fishcamp locations of' seasonal residents and families from other communities are not depicted in Figure 3. In Particular, a number of families from St. Mary's and Pilot Station had fishcamps along the main Yukon River, frequently intermingled with fishcamps of Mountain Village residents. Several families from Unalakleet and St. Michael resided on the Yukon delta during the summer of 1981, especially at middle mouth. Reportedly, Scammon Bay families regularly moved north to fish salmon around the mouth of the Black River. In 1981 some Scammon Bay people fished along the south pass, apparently with fishcamps established on Manning Island. In addition, a number of fishermen with residences outside of' the Yukon delta region established camps to fish and sell salmon. None of these locations is depicted in Figure 3.

The social composition of fishcamps along the Yukon delta is discussed in Chapter 6. In brief, fishcamp sites frequently were occupied by one or several families related to one another by bilaterally extended kinship links. It was not uncommon, however, to find persons or families fishing together who did not demonstrate close kinship

affiliations. They fished together from the same camp simply as "friends" or 'buddies. "

Fishcamp locations, according to most respondents queried, 'belonged" to no one particular family. The designation of 'so-and-so% fishcamp" did not imply ownership. Instead, fishcamp sites were 'places" occupied by persons. Most fishcamps had names, generally referring to some prominent physical feature, such as a river or a vegetation type. For instance, one fishcamp north of Emmonak was called Kipchuq, "the big twist," referring to a sharp incised meander of Kawanak Pass at that location. The people residing at that location were termed Kipchugmiut, the "people of the big twisty." Thus, people frequently were named after the fishcamp, rather than fishcamps after people. The people inhabiting a fishcamp might change over time, but the identity of the place endured. This represents an interesting contrast to Western place designations which commonly are named after people, and suggests that percieved relationships between people and land within the Kwikpagmiut cultural group may be different in some respects from people-land relationships in certain Western cultures.

Some fishcamp sites were known to have been occupied for generations. The camp of Nilaraq, located near the south mouth, fished in 1981 by an Emmonak resident, had been utilized as far back as anyone could remember. However, other fishcamp locations changed over time, primarily due to the continual erosion of river banks, and the changing course of the Yukon. Frequent and apparently enjoyable topics of

conversation by Kwikpagmiut while boating concerned former campsites now fallen into the river.

Most fishcamps were strategically located to take advantage of a particular set of fishing conditions. For instance, an eddy where the current of the river slacks and reverses near the bank comonly due to an incoming slough or a promitory, was considered a prime site for placing a set net. In eddies, a net hangs loosely and vertically in the water so that the webbing retains an optimal shape for catching fish. In addition, reportedly salmon swim along eddies meeting less resistance from the current. Other strategic sites were located near a narrowing of stream channels, where fish were forced to funnel; near submerged sand bars, which also directed fish movements; or near a coastal mouth where fish were expected to school before entering the river system.

When a fishcamp lost its strategic advantage, it frequently was abandoned. Consequently, one may expect that the patterning of fishcamps existing in 1981 would show substantial variations from those to be mapped other years. A ten-year-old map of campsites made by the Emmonak Corporation durin land claim proceedings located many camps of Emmonak residents at the mouth of the Bugomowik Slough, the next major waterway north of Kwiguk Pass. In 1981, these camps apparently were unoccupied. Reportedly, the slough's mouth had silted up, making the area less productive for fishing.

Although sites changed, some families occupied camps for long periods. This occurred in part because fishcamps frequently became a favorite residence for families, enjoyed sometimes more than the winter community. To illustrate this continuity, of eight Kotlik families interviewed in 1976, all occupied the same fishcamps when interviewed five years later in 1981 (Wolfe, 1979). One family had been at its site for over 10 years. As another example of fishcamp tenure, one fisherman from Alakanuk reported he maintained a fishcamp on Manning Island from 1949 to 1967, placing nets in Casey% Channel. He moved to Tin Can Point where his fishcamp was from 1968 to 1979. Since then he had fished from Alakanuk, placing his nets along sand bars in Kwikluak Pass. His son, who also had a fishing license, still fished near the Tin Can Point site.

The relative age of a fishcamp frequently was evident from its physical features. At times a fishcamp began as a floorless white tent without amenities other than a Coleman stove, inhabited by one or two young males. Typically, the men operated from the camp during open commercial fishing periods, eating and resting at the tent between checking set nets, drifting, or making fish deliveries. During closed periods solitary males frequently returned to their parents' house in the main village, or if married, to their own families. Fish taken at camp might be carried to the winter village to be cut, air dried, and smoked by kin relations. The transport of a wife and children to camp usually was accompanied by the construction of a plywood floor and partial side walls for the tent, fish drying racks, and eventually a smokehouse of

wood or corrugated sheet metal. During the building stage salmon might be air dried at camp, and smoked at the winter' village. Tents housing families commonly were furnished with a cast iron stove, or a stove made from gasoline drums; tables and stools fashioned from driftwood; sleeping bags or bedding; and storage shelves for clothing, food, and eating and cooking utensils. Further additions to a fishcamp included fish-cutting tables by the river bank, a toilet pit in the nearby willows, and a CB radio antenna. By this stage, usually several families have located together at the site. Fishcamps most commonly grew by attracting other families. When families attached themselves to pre-existing camps, frequently rack and smokehouse facilities were shared temporarily. At this point in the evolution of a camp, families usually stayed longer periods, drying and smoking fish at camp for the winter food supply. The final additions to a 'mature' camp might include wooden houses and a sweat bath, traditionally a symbolic focus of a community.

The fishcamps on the delta represented different stages of this evolution, and the use of fishcamps varied accordingly. Some camps were utilized only during open fishing periods by young men, to be emptied during closed periods. At some camps, whole families moved back and forth between fishcamps and winter villages during the summer. If family members held jobs at the winter village, frequently only partial families were present at camp. Some families stayed at camp early in the season, putting up fish before the commercial season began and during the first few weeks, returning to the winter village at some

point. Other families fished for commercial sale from the winter village, and moved to camp at the later stages of the season to put up subsistence fall chums and silvers. A substantial number of households stayed the entire summer at camp, not returning to the winter village until the onset of freezeup. The camp might serve as a base for berry picking and seal hunting during the late summer and early fall months.

Some of the variation in settlement patterning can be illustrated by the following cases.

Case 1. This Kotlik family illustrates long tenure at fishcamp. During 1980, the family arrived at fishcamp on May 19, soon after ice breakup, before even the smelt run preceding the summer salmon runs. At camp were the household head, his wife, four children, and his wife's sister% daughter. The eldest son remained at Kotlik for seasonal employment. The family stayed at fishcamp throughout the entire commercial season until the last week of August. Both the father and son had commercial salmon permits, and fished from the camp with set nets or drift nets. During the season, the family put up three 50-pound barrels of kings, four 6-gallon buckets of king strips, one 50-pound barrel of chums, and five 6-gallon buckets of dried chum and coho salmon. The family made infrequent visits to the winter village.

Case 2. This case illustrates fishcamp residence without a family. Two Alakanuk brothers, one married with his own household, and the other single and living with his parents, set nets from a fishcamp on Manning

Island, where they fished without their families during commercial periods during 1980. Fish from the commercial catch were transported home to the parent's hosuehold to be processed by the mother and father, who because of a partial disability could not currently fish. Last year about 70 kings and 100 chums and cohos were put up for the extended family, cut and dried at Alakanuk. Some of the fish were put up before the commercial season began, and some cohos were dried after the commercial season ended. Both households shared from the common cache of food. The commercial earning belonged to each of the boys, and was not an automatic part of the parent% income. However, because of the poor runs last year, the boys 'came out in the hole" for the season.

Case 3. The head of this household at Stebbins had full-time employment at the winter village, from which he engaged in most fishing and hunting activities in 1980. In anticipation of the salmon season, he took off the entire month of June without pay to fish with his extended family along the Pikmiktalik River. At camp in 1980 were his wife and three children plus his eldest son and his children. None possessed commercial salmon permits. With a 25-fathom net he caught enough salmon to fill one 50-pound barrel of salted kings, one 10-pound barrel of dried kings, one 50-pound barrel of dried chums, and four 6-gallon buckets of chums and a few cohos. He also gave kings from his net to another household camping at Pikmiktalik who salted two barrels of kings. He returned with his family to Stebbins in July to resume work. Normally the family would have remained at camp longer. Because of the short

stay in 1980, there was no time to put up king salmon strips, as would have been done most years.

Case 4. The following case may exemplify a family in transition between fishcamps. This 55-year-old man from Alakanuk formerly had a fishcamp on a slough near the mouth of the Kwikluak Pass. However, the channel was becoming shallow, the eddies were changing, and there were 'too many nets" located near his own. So during 1980 he decided to drift for commercial salmon 25 miles upriver below Fish Village staying at a fishcamp nearby of a 'distant relative," his 'buddy." He would leave his wife and young children Monday mornings, boat upriver to fish Monday 6:00 P.M. to Tuesday 6:00 P.M., and return to Alakanuk Tuesday evening. He repeated the trip again to fish the open period Thursday 6:00 P.M. to Friday 6:00 P.M. His two oldest sons, unmarried, in their 20s, and with permits, accompanied him. As there was no smokehouse yet at the 'new" camp, he saved a few unsold fish to be cut, air dried, and smoked by his wife at Alakanuk. After the commerical season closed, his nets were placed at Alakanuk Pass. The catch of cohos was processed for personal use at Alakanuk. Last year, in this manner, the family processed 35 kings and 132 small salmon, cut into strips or salted in barrels. This year he chose to follow the same pattern, but fishing with his second son only. The eldest (28 years old) decided to locate at another upriver camp with a 'buddy" from St. Mary%. Conceivably, if the father's fishcamp site seems advantageous, a rack and smokehouse may be constructed, and the entire family transported to fishcamp. The eldest son, in turn, may choose to attach himself to his

family's camp, to another fishcamp, or establish his own camp alone or with friends.

Fall, Winter, and Spring Camps

In addition to summer fishcamps, many families or individuals maintained camps at intervals during the fall, winter, and spring. These camps tended to be located on inland tundra or mountain areas away from the Yukon River. Many of these camp locations were temporary sites established for a few days only as a base camp for harvesting a food resource distant from the winter community. Because of their temporary nature, and because their locations might change from year to year, the camps were less likely to be named like fishcamp sites. Certain camps for winter hunting or trapping, however, were used on a more permanent, or regular basis, and were likely to have names. Abandoned village locations frequently were sites for camps, utilized by persons born there, or by persons related to such persons, and who consequently were familiar with the resources in the region. Because of the great number and variability of campsites and the short duration of this study, there was no attempt made to map fall, winter, and spring camp locations. Such an endeavor would be valuable to illustrate the full extent of land and resource use patterns in the Kwikpagmiut region.

Fall camps were frequently established during August and September by families for the purpose of gathering berries. Whole families frequently boated up Yukon tributaries to upland areas to camp for

several days to a week, during which time the members would engage in concentrated berry picking. Tents might be set at a new location each day as the family unit moved to find new berry areas. Families frequently traveled long distances in the procurement of berries. For instance, in 1981 family groups from Emmonak were noted to pick berries in areas near the Pastolik River, the hills above Fish Village, and the tundra areas around Black River and Kusilvak Mountains. It was evident that, given such wide search patterns by families for berries, probably the whole Kwikpagmiut region became utilized during fall berry harvest over a series of years.

During fall, winter, and spring, certain individuals regularly established camps for the purposes of hunting moose, caribou, seals, waterfowl, fur bearers, and muskrats. Like berry camps, these camps collectively covered the entire Kwikpagmiut region, as illustrated by the following examples. A fall camp utilized by Kotlik residents for hunting seal, belukha, and waterfowl was located near the extreme lip of the flat delta at Okshokwewhik Pass mouth. From the evident number of belukha bones from former kills, the site apparently received regular use. Two winter camps utilized by Emmonak and Alakanuk hunters were located in the Andreafsky Mountains along the Andreafsky River (the Macherevik River), north of St. Mary%, over 75 miles by snow-machine from the winter village. A fall and winter camp for taking fur bearers by Mountain Village hunters was located about 40 miles from the winter village, south of Kusilvak Mountains along the Kashunuk River. Some Sheldon Point, Alakanuk, and Emmonak residents utilized fall and

winter camps as far south as the Mukunoaliwik River, over 50 miles from the winter village. Some Stebbins families established berry camps on Stuart Island during fall. Winter hunting at times was conducted from camps located in the Andreafsky Mountains to the south of the village, including the Golsovia River, East Fork of the Andreafsky, west to the headwaiters of the Pikmiktalik River.

Unlike fall berry picking camps, frequently the hunting camps established in fall, winter, and spring were occupied solely by male hunters. Women and young children normally remained at the winter village while husbands and single young adult males made short hunting forays for land mammals. Historically whole familes traveled to fall, winter, and spring camps. However, mandatory public education forced women and chidren to remain at winter villages near schools.

Fall, winter, and spring camps were typically bases for harvesting several food resources simultaneously. While hunting seals or fur bearers, or while harvesting berries, typically a hunter would set a net to harvest whitefish, or a trap to harvest blackfish. A person was considered to have missed an opportunity if nets or traps for other food sources like fish were not placed while hunting. Even if no game were taken, a person frequently brought back firewood to compensate for the costs of making a hunting trip.

Summary

To summarize, the demographic patterning of the Yukon delta population in 1980-81 was characterized by substantial seasonal movement between settlements, covering the entire Yukon delta region. Maps of the Yukon delta commonly depict only winter communities, portraying a misleading view of the delta population as confined to a few locations with vast tracts of empty land between. Actually, effective hunting and fishing required substantial movement over relatively large areas. A map of summer settlements (fishcamps) revealed that the entire length of the main Yukon River from Mountain Village to the coast was inhabited during the summer months. About one-half of the households of winter communities moved to fishcamps during summer to harvest salmon. The locations of camps fell within general village "use areas." Duration of occupancy and social composition of these fishcamps were shown to vary greatly between families.

In addition to summer fishcamps, camps regularly were established be families and individuals at times during fall, winter, and spring. A cataloging of these camp sites was not attempted, but case examples illustrated their geographic dispersal. Like the Yukon River during summer, the entire land area comprising the Kwikpagmiut region, stretching from the Kasunuk and Black Rivers to the south and including the Andreafsky Mountains to the north contained camp sites from which individuals hunted, fished, and gathered at times during the seasonal round of activities. As a general rule, during winter the population

was most sedentary during summer most mobile. However, at all times during the year fishermen and hunters moved across the landscape between living and working areas.

CHAPTER 3

THE REGIONAL ECONOMY IN 1980-81

The Kwikpagmiut have persisted as a strong and growing cultural group because of their success in utilizing local resources of the land and the sea. The Kwikpagmiut over time have developed and refined a viable economic system particularly suited to the opportunities and challenges of the Yukon delta region. In 1980-81 the economic system was comprised of techniques and strategies for production and exchange matched to ecological and social realities. In terms of production, the Kwikpagmiut were invested highly in the yearly harvest of fish, game, and plant resources. A substantial portion of these yearly harvests were retained for home consumption, or exchanged within local trade networks. The remainder was sold for cash income which, in addition to providing basic sustenance, became the investment capital to ensure the capacity for fishing, hunting, and gathering in the future. The Kwikpagmiut recognized that a strong economic system had been maintained by achieving some optimal mix of food income produced directly from the land, rivers, and sea, and monetary income derived from the sale of harvested fish on external markets. Because of the region's high current dependency on local fish and game resources, disruptions to the fish and game resources or fishing and hunting practices, entailing reduced access to or availability of the region's resources,

would be expected to have direct and potentially negative effects on the economy of the Yukon delta population.

This chapter begins the description of the production and exchange systems that comprise the economy of the Yukon delta region. It seeks to establish a "baseline" description of the economy as it appeared during 1980-1981. Scientific standards for ethnographic description require that this section be written in the "past tense," even though it depicts 'current" realities for descriptions are made of events occurring about a year ago. Readers should be mindful that these are not decryptions of a remnant of the past. This description is of current conditions in the Yukon delta area. Unless otherwise stated, past tense implies the period 1980-1981.

In the Kwikpagmiut society during 1980-1981, most production occurred within family units, the heads of which typically were males, self-employed in several roles, as fishermen, hunters, trappers, and seasonal wage earners. Further, many local exchanges of food between individuals flowed along lines of kinship affiliation. As most socially significant economic activity occurred within kinship-based groups, the economic system is described by and large at the level of the producing consuming, and exchanging household. It is acknowledged that other approaches can be taken; indeed, a more complete understanding of the cultural group's economic system requires other theoretical perspectives. The following depiction therefore represents

primarily a description of Kwikpagmiut production and exchange activities from the level of the household unit.

The annual seasonal round of economic activities in the region is presented first. This is primary because the regional economy was indissolubly linked with the annual cycles of fish and game populations. In production, the Kwikpagmiut judiciously adjusted their labor and capital investments to the exterior requirements of ecological systems. Following this, the geographic patterns of resource utilization are depicted. Harvest efforts of a sample of households from six communities within the study area are mapped to suggest the spatial patterning of economic activity. The maps show that most major food and commerical resources in the region originated from the ocean or littoral fringe. General characteristics of the economy are then discussed. The Kwikpagmiut economy is characterized as being a diversified system, organized by the principles of kinship and secondary associations? manifesting adaptability to short term fluctuations in resource levels. The major species utilized, and Kwikpagmiut harvest techniques are discussed throughout. Finally, the integration of the "cash" and "subsistence" sectors of the economy is discussed.

As can be noted, this chapter presents the Kwikpagmiut economy in terms of general patterns. Further chapters seek to quantify food output in the study area for a single year, and to depict certain social and symbolic aspects of the economic system.

The Annual Round of Economic Activities

The economy of the Yukon delta region during 1980-1981 was based primarily upon the utilization of local land, river, and sea resources including fish, sea mammals, land mammals, waterfowl, and plants. Most families were supported by the harvest efforts of members, who were self-employed as fishermen hunters, and trappers. The harvested products were processed for personal use by the family, exchanged locally, or sold on export markets. In addition to the harvest of local land, river, and sea resources, the economy offered limited, generally seasonal, employment in wage-paying occupations. Consequently, a family also was supported by the monetary income derived from the temporary remunerative employment of household members. Because of the low levels of cash incomes for the region in general, and correspondingly increased cash requisites many families received some income in the form of federal or state income assistance.

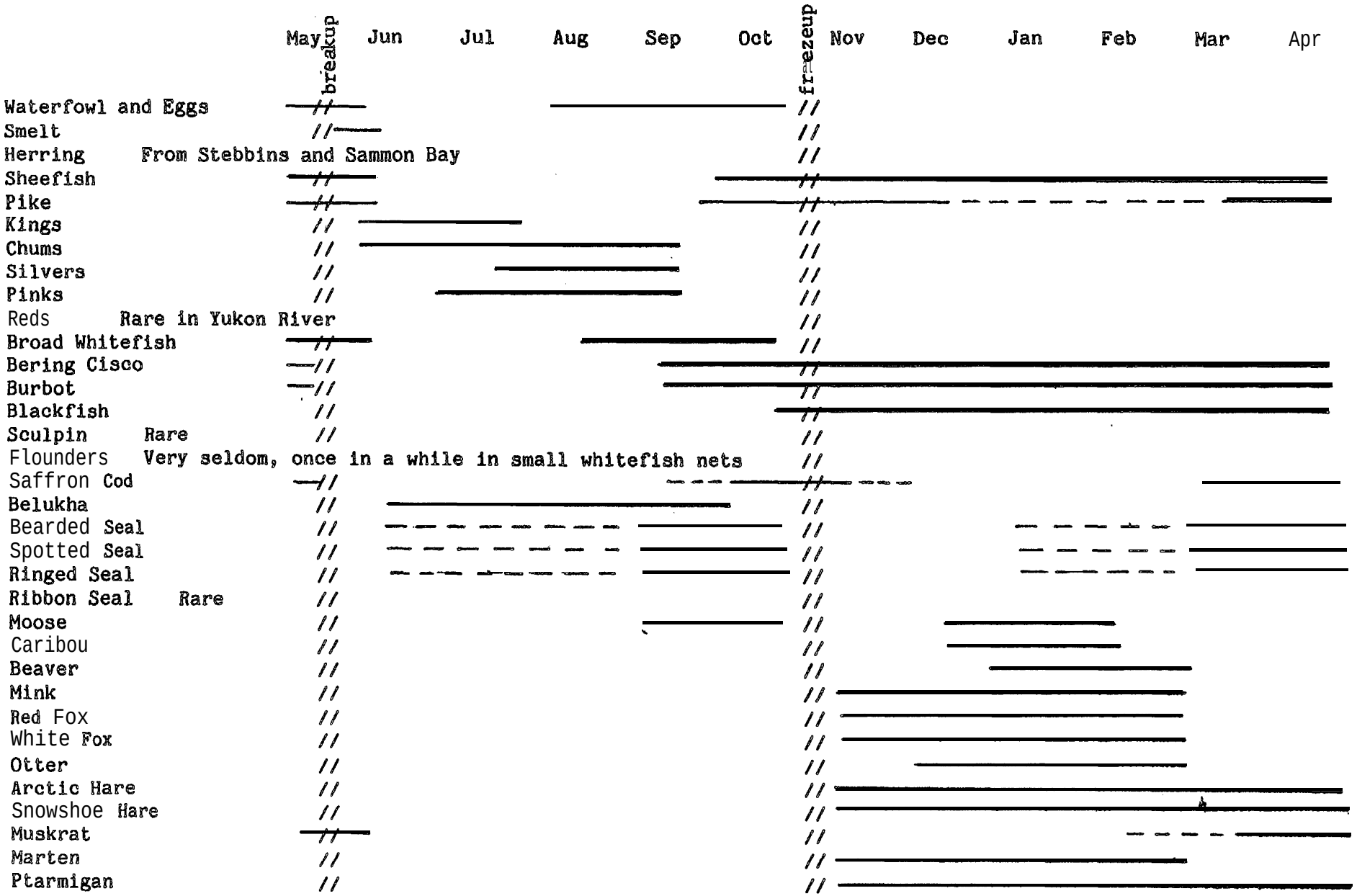
As previously stated, the regional economy was closely tied to the annual cycles of fish and wildlife populations. The local environment during delimited periods of the year provided Yukon delta residents with a set of economic opportunities. A fisherman or hunter held certain options concerning whether to harvest a food resource when it became locally available. Similarly, income opportunities arose as seasonal employment became available, such as construction projects during fall, commercial fish processing during summer, or local school-related jobs during fall, winter, and spring. The types of food

resources, employment opportunities, and their timing differed among communities in particular aspects. Nevertheless, most Kwikpagmiut communities close to the delta shared a general annual seasonal round of economic pursuits. This general cycle is presented below. The annual seasonal round of the people of Stebbins is presented separately from that of the Yukon delta people, because it exhibited notable differences.

The Kwikpagmiut Seasonal Round

The general seasonal round of fishing and hunting activities for the Kwikpagmiut region is depicted in Figure 4. The figure illustrates the times of year when selected food resources typically were harvested by residents of the Yukon delta region. Figure 4 does not portray fluctuations in the seasonal availability or abundance of fish and wildlife resources. A resource may be available on the delta the year around, yet may be harvested predominantly during particular seasonal periods. The incidental harvest of these species is not depicted in the figure. For instance, sheefish were occasionally taken in gill nets set for salmon during summer. These incidental catches are not shown in the seasonal round as a major economic activity. Nets for sheefish were placed primarily after freezeup and maintained by certain individuals throughout the winter and spring. It is this activity that is depicted.

Figure 4. SEASONAL ROUND OF FISHING, HUNTING, AND TRAPPING ACTIVITIES FOR SELECTED SPECIES, LOWER YUKON DELTA AREA, DURING 1980-1981 (——— USUAL PERIOD OF HARVEST EFFORT ; - - - - OCCASIONAL PERIOD OF HARVEST EFFORT)



The figure also does not reflect variations in the timing or level of harvest effort. In certain years, the harvest of resources may occur relatively early or late, depending upon environmental conditions. For instance, sealing from the edge of the land-fast ice pack could take place anywhere from about January to May. Most years it occurred from the end of February to April. Thus, the timing of harvest efforts varied from year to year. A second major variant is level of harvest effort. The number of individuals harvesting a resource at any point in time varied considerably during a year, and from year to year. For instance, the greatest number of nets for sheefish typically were maintained during the first few weeks following the freezeup of the Yukon River. Usually certain individuals removed their nets as their household's need for sheefish diminished and ice fishing became more difficult; others maintained nets throughout the entire year. The figure does not represent these variable patterns of time or harvest effort, variations which could be documented adequately only with longitudinal data.

For the Yukon delta region as a whole, the breakup of ice on the Yukon River signaled the beginning of the period of intensive summer salmon fishing activities. From the comparative quiescence of midwinter and spring, summer burgeoned with activity. Wooden skiffs were recaulked, sanded, and painted; outboard motors overhauled; and gill nets purchased, rehung, or mended. Initial supplies of food, fuel, and other materials commonly were purchased on credit from community stores or from commercial fish buyers who arrived during the first weeks of

summer. In preparation for the salmon season, a family frequently incurred substantial debt to be paid off with commercial salmon earnings. There were no banks in the six Yukon delta communities at the time of the study, so local stores and commercial fish buyers were forced into assuming lending roles.

Other harvest efforts occurred concurrently with salmon fishing preparations. Certain families, especially containing elderly members, harvested a late spring and early summer run of sheefish at the delta mouth. The sheefish were said to run in the main river just before and after breakup. At this time the flesh was considered to be of high quality, especially in comparison with summer sheefish. Sheefish taken in spring was cut, hung, and air dried on fish racks. At this time small quantities of eggs of migratory waterfowl might be collected, " along with the gathering of certain early summer plants, usually by women, children, or the elderly. An early summer run of smelt on the main Yukon River lasting no more than a few days was harvested with dip nets by members of a few families in Kotlik, Alakanuk, Emmonak, and Sheldon Point, commonly by adolescent and young adult members. The smelt usually became distributed widely among families in the region, and surplus was strung and dried for later consumption.

The first run of king salmon normally occurred during the early part of June. However, in recent years the king run had formed earlier, beginning the latter part of May. Some families placed nets to harvest these early runs, with the intent of putting up a substantial portion

of the winter supply of dried salmon even before the commerical fishing season opened. Late May and early June, families moved to summer fishcamps, described in Chapter 2. During 1981, approximately half of the households from the six delta communities resided at a fishcamp for some period during summer. At times during early summer, winter communities appeared virtually bereft of people.

Successive runs of king, chum, pink, and coho salmon were harvested during summer. Salmon were taken by two main techniques: by placing set gill nets in eddies, along river banks, along coastal channels, and in mid-river along submerged sand bars; or by drifting nets from small skiffs along relatively straight, snag-free stretches of river. Nets generally were managed by men, although man-woman teams were common, and occasionally solitary women handled set nets. Fishing efforts occurred during 24-hour open periods twice a week as established by state regulations. Between open periods nets had to be removed from the river. Harvested fish was sold to commercial buyers (if a person had a commercial salmon permit), and retained and processed for personal use and local exchange. Some individuals had no commercial fishing permits. Consequently, all fish from their nets had to be processed for personal use. Processing of salmon for home consumption was generally a woman's occupation. The most common preservation technique was to partially air dry the flesh for several days on fish racks, and then slowly smoke the salmon within a smokehouse for up to several weeks.

For most households, salmon represented the largest single source of food and monetary income. Of all resources, it might be considered the staple food and primary market product of the region. Depending upon its size, a family put up a sizable stock of dried salmon during summer for storage in a cache at the winter village. A family normally put up supplies of salmon to last at least 9 months following the end of summer, until the next summer salmon season. Income from the sale of salmon was the only source of monetary income for many families that was dependable each year. Whereas most other remunerative work represented irregular short term employment opportunities, a household could count upon the salmon Puns each year to provide income. When the salmon run was not strong, households frequently ran out of cash, and went into debt for the year to local stores. The economic solvency of Kwikpagmiut households usually pivoted upon the success of salmon fishing.

During summer Kwikpagmiut hunters also captured an occasional belukha, spotted seal, or adolescent bearded seal near the Yukon mouth or on the Yukon River itself. For coastal Kwikpagmiut, these usually represented fortuitous events, rather than planned hunting efforts. Most summer economic activities were related to salmon fishing, not sea mammal hunting. Belukhas at times were abundant around the mouth of the Yukon during early summer when they were feeding upon migrating salmon, whereas seals were less frequent visitors. A substantial portion of the few belukhas and seals taken during summer were caught in salmon nets, whereas the remainder were harpooned and shot from boats. Seals

occasionally ventured as far up the Yukon River as Russian Mission. Main river Kwikpagmiut, unlike their coastal relatives, maintained a watchful eye for riverine seals during summer, and attempted to capture them with rifles and harpoons whenever possible. Seals taken upriver during summer might lessen a household% need to procure seal oil and meat from the coast during fall.

Salmon fishing normally continued through August, and frequently into September. Some years, as in 1981, fishing effort diminished earlier, sometimes by late July, because of large early harvests.

During August many households began to harvest other food resources. Salmonberries, blueberries, blackberries, and lowbush cranberries became ripe from early August through September. Whole families frequently made excursions to upland tundra areas to harvest berries. Many families established fall camps on the tundra as bases from which to harvest. Households attempted to procure several 6-gallon buckets of berries, which were frozen or stored in cool caches for use the remainder of the year. Berries were an essential ingredient of a traditional food dish, agutak, made of boiled fish (especially white-fish and pike), fats (such as seal oil, vegetable oil, lard, or tallow), and fruit.

Hunting waterfowl also began during August and continued into October for certain species. Hunting waterfowl was predominantly a men's activity. Either singly or in hunting groups of two or three, men

would boat or wade among sloughs and estuaries known to be frequented by ducks, geese, cranes, and swans, shooting flying or swimming birds with shotguns. Camps were sometimes established from which the hunting of birds, seals, and/or moose occurred. Generally, men harvested enough birds to last his family and perhaps an elderly neighbor or relative a few months as an occasional meal or base stock for soup. As indicated in later chapters, an ethic prevailed among most Kwikpagmiut concerning most resources and waterfowl in particular, against taking more than was needed by a family. Although hunting clearly was a pleasurable activity for men, hunting primarily for sport and enjoyment was not considered proper or right. Most households maintained strict limits on waterfowl harvest levels for these ethical reasons. In addition, waterfowl hunting was a relatively expensive subsistence pursuit, requiring substantial costs in boat fuel and shells for a relatively modest food return. The costs of hunting placed practical limits on waterfowl takes for most people. Some households indicated that they took only enough waterfowl to be eaten on special occasions. Birds taken during fall were gutted and slightly salted. by women and hung in caches.

While at fall camps, men occasionally set short nets with about 4-inch stretch mesh to harvest broad whitefish, and nets with 3-inch mesh to harvest Bering cisco and round whitefish during August. The major harvest of whitefish generally occurred later, just before and after freezeup about late October or early November.

Throughout early spring, summer, and fall, women and children frequently harvested local plants. Collecting ethnobotanical information was not a feasible objective of this study, plant identification representing a specialized reseach task. Nevertheless, from general indications, a wide variety of plants were being utilized by families on the Yukon delta. Plants utilized included the Pallus buttercup, marestail, dwarf fireweed, sourdock, cowslip, wild rhubarb, wild celery, willow leaves, tall cottongrass, Labrador tea, berries listed previously, and a number of other unidentified greens, bulbs, and flowers. Many of these plants were collected on low lying tundra along the Bering Sea coast and coastal islands.

The period of intensive sealing activities along the coast occurred from late August until freezing. During fall, seals and belukhas were hunted from boats, usually with a crew of two, one to operate the motor, the other to harpoon and shoot. In the hunting areas of south pass villages, the species taken most commonly during fall were spotted seals, which at times migrated in large groups along the coast, and adolescent bearded seals. In the hunting areas of Kotlik and Stebbins, ringed seals also were frequently captured during fall. Seals and belukhas occasionally were hunted by large groups of boats. When this occurred the fat and meat of bearded seals and belukhas generally were divided among participating hunters more or less according to traditional cultural rules (the division termed ninyiq), described in Chapter 7. Small seal species normally were not subject to ninyiq conventions. Ribbon seals were rarely taken along the delta.

Occasionally sea lions and walruses were killed. Most seal meat was consumed soon. after capture by a family; some portion might be air dried for later use. Seal fat, and occasionally belukha fat, were rendered into oil. Seal oil was considered an indispensable food item by Kwikpagmiut. Dried fish was dipped into seal oil while being eaten; and seal oil was a common component of soups and other prepared dishes. Seals, belukhas, and seal oil were major food items exchanged among friends and relatives from the coastal district to main river communities, discussed further in Chapter 7. Bearded seal hides provided material for the soles of summer and winter boots, while the skins of spotted and ringed seals were utilized for the upper portions of boots, parkas, and other handcrafted products.

During September small parties of' men commonly traveled to the rivers and valleys surrounding Pilot Station, Russian Mission, and Paimiut to hunt moose. For men from coastal villages, these trips might last over a week and require substantial quantities of fuel (up to two 55-gallon drums). Other families might receive moose meat from relatives and friends upriver, sometimes in exchange for seal oil. Occasionally moose were taken on the flats of the delta as well.

Just before and immediately following the freezeup of the main Yukon River, usually in late October and early November, a second period of intensive fishing occurred within most communities. At this time there were substantial runs of broad whitefish, Bering cisco, sheefish, and saffron cod in the small rivers, sloughs, and estuarine channels of the

delta. The role of these non-salmon fish species in the Kwikpagmiut economy generally has been unrecognized in the literature. During 7980-1981 whitefish and cod represented a significant portion of the annual food production of most families. Their importance has gone unnoticed probably for several reasons: they were harvested at a season when most seasonal residents have left the delta; they were fish species previously with no commerical market value; and their seasonal habits were relatively undocumented within the scientific community.

Coastal fishermen set short nets with about a 3-inch stretch mesh along narrow estuarine sloughs for small whitefish. In a few days or weeks, hundreds of pounds of Bering cisco and small sheefish frequently were taken. Upriver at Mountain Village, small whitefish nets set in Yukon tributaries caught Bering cisco, small pike, and small broad whitefish. Some individuals reset their small whitefish nets after freezeup near the village, where they caught fresh fish for the family throughout the winter. Small whitefish commonly were stored in caches in cardboard boxes; more occasionally they were air dried.

Larger mesh nets (about 4 inches) frequently were set for broad white-fish just before and after freezeup in freshwater streams and lakes. During September, large broad whitefish could be taken migrating from lakes, but smaller specimens could be obtained year around in side sloughs, lakes, and along the coastal passes, Upriver, broad whitefish catches generally continued strong through December, slacking off during January and February, and building again during March and April

just before breakup. Many individuals along the main river maintained set nets under the ice from October until May. Whitefish were eaten fresh, dried, or "aged" several weeks in a cache.

Sheefish were harvested in gill nets with about a 6-inch mesh, set beneath the river ice after freezeup. Large catches of sheefish were taken during November within coastal Kwikpagmiut communities. Upriver fishermen from Mountain Village reported that, while sheefish were taken in salmon nets during summer and broad whitefish nets most other seasons, their number built to a heavy run during January and February. Many fishermen maintained sheefish nets from October through May beneath the main river ice, taking sheefish and an occasional burbot. The nets were occasionally reset after ice breakup in coastal communities to harvest a strong sheefish run just before and after ice breakup.

In addition to these varieties of' whitefish, saffron cod (locally called egathluk and "tom cods") along the coast, and lampreys (called "eels," and ngumugiuq) at Mountain Village, were harvsted before or soon after freezeup. Saffron cod were taken with large hooped dip nets utilized as seines by fishermen from Emmonak, Alakanuk, and Sheldon Point. While one person placed the net within the mouth of a small estuary at high tide, another person would beat the water's surface with paddles upriver, driving fish into the net. In this manner sometimes several hundred pounds of fish were taken within a few hours. More commonly, saffron cod were taken by hooking through ice holes

using lures or baited hooks. Cod were frozen and strung for drying. The Kwikpagmiut of main river villages from Mountain Village to Russian Mission frequently harvested a brief run of lampreys soon after freeze-up. When the run appeared, holes were chopped in the ice in front of the village, and lampreys scooped from the water. At Mountain Village, people used a wooden device about 4 feet long, 4 inches wide, and 1 inch thick, its edges rimmed with half-sunk penny nails with their heads snipped off. Lampreys were snagged on the nails as the device was swung laterally, first to one side and then the other, through ice trenches. Other individuals utilized dip nets. Lampreys were commonly eaten baked, and were exchanged widely throughout the region.

The Kwikpagmiut, especially of the south passes and main river, placed basket traps for blackfish beneath the ice of lakes and narrow tundra creeks just before and soon after freezeup. The traps were made of small wire mesh stretched around wooden or plastic hoop frames, with a wire mesh funnel. set into one end. Some individuals still utilized basket traps made of thin pine strips. Traps might be reset in different locations throughout the fall, winter, and spring months. The abundant blackfish were widely shared throughout a winter community, so that the traps of a few individuals could procure food for several families. Blackfish also was used to feed family dogs.

A few individuals placed baited hooks under the ice for burbot following freezeup. A line was stretched between two poles, along which hooks were secured and baited with live blackfish or whitefish.

Burbot also were taken in gill nets set for sheefish and broad white-fish throughout fall, winter, and spring. At St. Mary's fish traps were maintained under the ice to harvest burbot.

After about early December, activities directed toward food procurement generally diminished in intensity! remaining at a relatively low level until about March. Fish nets, traps, and hooks beneath the ice might be checked on alternative days, generally taking enough to provide fresh fish for the family to supplement dried salmon. During winter people commonly jigged for whitefish, sheefish, cod, and pike through holes in the river ice near the winter village. Longer trips might be taken to jigging areas noted to be productive. These excursions acquired the air of a recreational outing, entailing jigging and picnicking on the ice.

Winter marked the beginning of hunting and trapping for fur bearers. The most common practice was for male hunters to make one-day hunting trips by snowmachine over the flat tundra regions surrounding the winter village, looking for fox and checking baited spring traps, mink basket traps, otter traps, and beaver snares. The timing and method of fur harvest activities are summarized in Table 2. Some individuals maintained trapping camps several miles from the winter village. These persons were likely to maintain traplines which would be checked on regular rounds. Small land mammals provided a source of fresh meat for the table, *fur* for parka ruffs, mittens, dress parkas, and other hand-crafted items, and monetary income when sold to fur buyers. The meat

Table 2

FURBEARER HARVEST SEASONS AND METHODS IN THE KWIKPAGMIUT REGION

	Months Taken for Sale	Months Taken for Subsistence Use	Harvest Methods
Muskrat	April to June	April-June, also in fall and winter mink traps	.22 rifle, #1, #1-1/2 spring traps, mink traps
Tundra Hare	fur too fragile for sale	March-May; sometimes entire winter	.22, wire loop snares
Snowshoe Hare	fur too fragile for sale	from first snow to May	.22, wire loop snares
Beaver	January to March (pelts prime for sale)	summer and fall (pelts best for clothing trim)	winter: wire loop snares, #2, #3 spring traps; summer: rifles
Mink	November to February (pelts prime)	rarely used for subsistence; some parka trim	small wire basket traps; #1, #1-1/2 spring traps; wire loop snares
Fox	November to February (pelts prime)	primarily sold	baited #1-1/2, #3 spring traps; rifles
Land Otter	November to February	November to February	large wire basket traps; rifles; clubs

of tundra and snowshoe hares, beaver, and land otter was eaten regularly when taken. By contrast, the meat of muskrats occasionally was eaten, mink rarely and fox never. When not personally consumed, the meat of fur bearers provided food for family dogs.

During January and February, households sometimes subsisted on diets predominantly composed of dried fish and cereal products from the local stores. The fresh meat of hares and an occasional ptarmigan added welcome variety to the uniform fare. To procure fresh meat for the village during these months, one or two small hunting parties each winter might enter the Andreafsky Mountains on the northern boundaries of the Kwikpagmiut region in search of moose and caribou. Hunting trips usually were carried' out in sub-zero temperatures with the threat of sudden Arctic snowstorms trapping the party in tents many miles from home. Such hardships were considered justified by the prospect of fresh meat during a lean time of the year. A successful hunt might yield one or two moose or caribou per group. The harvest typically was divided among hunters, each of whom frequently distributed the meat among relatives and friends at the winter village. Thereby many families in the community usually received a share of the kill.

Beginning in Maroh and April (at times as early as January and February), small parties of men from coastal Kwikpagmiut communities made trips to the edge of the land-fast ice of the delta to hunt seals. Ringed seals and bearded seals frequented lead areas throughout the late fall, winter, and spring. However, severe weather and ice conditions

usually precluded hunting trips until late winter or spring. Men generally traveled by snowmachines directly out from the winter village until the lead area was encountered. Hunting frequently occurred 20 to 30 miles from shore, and sometimes farther. Seals were shot with high caliber rifles as they appeared swimming or basking on ice floes, the floating carcass retrieved with a boat dragged on a work sled. Some hunters motored about ice floes in boats searching for seals. The oil of spring seals commonly was distributed among relatives and friends within the winter village. During spring sealing trips, persons also frequently hooked for saffron cod through tidal cracks in the ice.

During March and April, many residents of south pass and main river villages made one or two trips by snowmachine to the base of the Kusilvak Mountains to place nets and hook for pike in the Kipneak (Black) River. Several hundred pounds of pike commonly were taken by one person from a single day's activities. Families from Chevak, Hooper Bay, and Scammon Bay also fished this area, which at times took on the appearance of a tent city on the ice.

During late spring, subsistence activities continued to increase in number and intensity from the midwinter lull. Broad whitefish, sheefish, and saffron cod catches from set nets and hooking sites increased in volume due to spring runs. Hunters, especially young males, searched for muskrats in low wet areas surrounding the village. Some established "rat camps" on inland tundra areas to hunt muskrats for several days to a week. About middle April, migratory waterfowl began

their return to the delta, a welcome sign to villagers, signaling fresh meat once again and the beginning of a new summer. Food stores in family caches and local retail stores were at their lowest yearly levels at this time. It was not uncommon for village stores to be depleted of most staple items, showing bare shelves which would not be filled until the first barge arrived after spring breakup. Villages frequently ran out of gasoline as well, despite it being rationed during winter. Individuals sometimes made trips to neighboring communities to buy one or two drums of fuel and stove oil.

At this time of general scarcity, hunters commonly made one or two hunting trips to procure waterfowl for their families. Using shotguns, hunters killed waterfowl as they flew over tundra beginning to thaw from its cover of snow. Most hunters restricted their harvests to limited numbers of birds, just enough to provide the family with some fresh meat until the salmon runs arrived.

Nets and traps set throughout winter were removed when the ice became rotten, honeycombed with air pockets. Trash accumulated during the year frequently was stacked on river ice, to be carried off with breakup sometime middle May to early June. After ice breakup, with the lengthening of days, families made preparations to begin anew the annual cycle of economic activities.

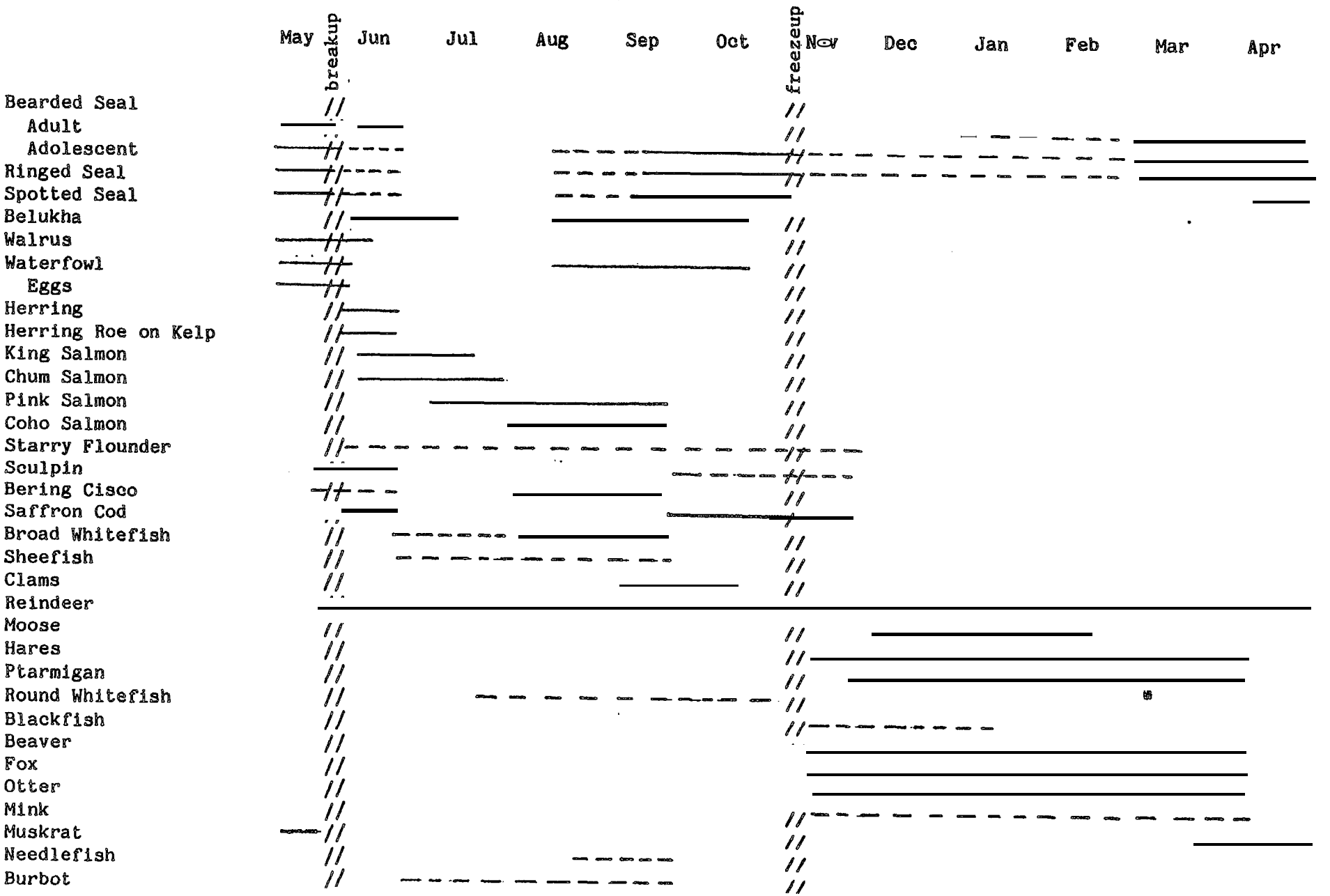
The Tapraqmiut Seasonal Round

The annual round of economic activities of the Tapraqmiut at Stebbins during 1980-81 differed in several respects from that of the Kwikpagmiut (Figure 5). Their location along the southern coast of Norton Sound at St. Michael Island enhanced the importance of small sea mammals, walrus, and herring in the local economy. At this location, land-fast ice tended to break into lead areas closer to shore than on the relatively featureless coast of the delta. These lead areas supported populations of seal during the winter, and seal, walrus and belukha during spring.

Hunting for seals might occur throughout the winter at Stebbins, but sealing activities became intensive usually during March, April, and May. At this time, hunters traveled by snowmachine to the lead areas surrounding Stuart island, and extending east to about Egg Island, to shoot seals from the ice edge with high caliber rifles. Some hunters navigated skiffs between ice floes, searching for seals basking on the ice. During spring, both adolescent and adult bearded seals, ringed seals, and spotted seals could be taken, while ribbon seals were rare.

Beginning before the breakup of sea ice about May and continuing through June, walrus were hunted among the drifting sea ice pack. Groups of boats with between two and five hunters each searched for walrus in the waters to the north of Stuart Island and eastward to about Egg Island. Walrus were sighted by binoculars from vantage

Figure 5. SEASONAL ROUND OF FISHING, HUNTING, AND TRAPPING ACTIVITIES FOR SELECTED SPECIES, STEBBINS, DURING 1980-1981 (——— USUAL PERIOD OF HARVEST EFFORT; — — — OCCASIONAL PERIOD OF HARVEST EFFORT)



points on Stuart Island, and quietly approached from downwind by boats, to be shot with high caliber rifles. Reportedly, during early summer, walrus occasionally hauled out of the water on the northern beaches of Stuart Island.

As on the Yukon delta, during May hunters harvested waterfowl for their families, generally in the low-lying coastal areas south of Stebbins, such as the Kuiak River, Point Romanof, and on Stuart Island. One or two buckets of eggs from waterfowl and sea birds, such as pintail ducks, seagulls, murres, and puffins, might be gathered within nesting areas along the coast of Stuart Island, and the cliffs to the north and south of' Stebbins. Some households established spring camps for one or two days for conducting these activities.

As the sea ice became more broken, belukhas were taken in open waters between Stebbins and Stuart Island south to Point Romanof. In recent years, several belukhas have been taken by residents of the village as early as May. A sighting tower built near the Pikmiktalik River was sometimes used for spotting belukhas. Belukhas were pursued by boats, harpooned, and then shot while they pulled the hunter's boat. The meat and fat of belukha and walrus were likely to be distributed widely among kinship relations and friends of the hunters.

A major fish resource of the Tapraqmiut not found on the Yukon River delta was herring. Large runs of herring spawned along the rocky beaches surrounding Stebbins just after southern Norton Sound coastline

became ice free. In recent years, the runs had begun the second week of May, continuing. into middle June. Other years, the herring runs occurred later into summer. The Tapraqmiut harvested herring with small mesh set nets placed perpendicular to rocky beaches a few yards from shore.

Herring were shaken from the nets into an open skiff primarily by men and delivered at the volcanic sand beach of the village for processing by women. Herring were gutted and woven by the women into long strings of braided grasses, gathered and dried the previous fall, and hung to air dry on fishracks. A household attempted to put up enough strings of dried herring to last the family the entire year as a major food source. Most commonly, dried herring was eaten dipped in seal oil. Herring roe sacks frequently were removed and either frozen in plastic bags, dried, or preserved in brine. Strings of dried herring produced at Stebbins and Scammon Bay became distributed widely among Kwikpagmiut communities of the delta, usually as gifts along kinship networks, but also commonly as trade items on local markets, or exchange items at potlatches.

In 1980, a commercial fishery was opened for the sale of herring roe along southern Norton Sound. As Stebbins has been a 'cash poor" community, the development of a herring fishery was viewed with high hopes by the Stebbins people. In 1981 about a dozen families purchased on credit 7.3 meter, open herring boats powered by 150 to 200 horsepower engines from the Tapraqmiut Corporation, in order to more efficiently

harvest herring for commercial sale. During the 1981 season there were three 24-hour open periods for commercial herring.

Generally during May and June households gathered several bags of kelp covered with herring roe from the beaches of Stuart Island. 'Roe on kelp" was eaten fresh, dipped in seal oil. Surplus was frozen in plastic bags.

Before the initiation of the limited entry permit system for commercial salmon fishing on the Yukon River, about one-half of the Stebbins households established fishcamps on the Yukon delta for the purpose of harvesting subsistence and commercial salmon. Stebbins fishcamps frequently were located along the middle passes, and their commercial fish sold at Acres' Camp. However, for a variety of reasons, most Stebbins households were unable to obtain commercial salmon fishing permits, and thus were 'frozen out" of the commercial salmon industry. Currently, only seven households owned commercial permits. During 1980 and 1981, these households established summer fishcamps for harvesting salmon, generally from June through August at Apoon and Okwega Passes. By locating along north pass, the Stebbins fishermen took advantage of the unusually strong salmon runs through the north mouths in recent years.

Many Stebbins families without commercial salmon permits established fishcamps for the harvest of subsistence salmon nearer to Stebbins or fished for salmon from the winter village. Generally, families set nets for salmon after the diminution of the herring runs in June and

typically harvested fish from June through August. A large number of fishcamps were located near the traditional village site of Pikmiktalik along the Pikmiktalik River. Other fishcamp sites were located at Point Romanof, the mouths of the Nunavolnuk and Kuiak Rivers, Sourdough Point, and Stuart Island. Nets for kings and chums generally were placed perpendicular to the coastline near the mouths of rivers, inter. cepting salmon migrating along the coast. Nets for chum, pinks, and cohos at times were relocated along the rivers south of Stebbins to harvest runs traveling upriver. As on the delta, most of the salmon were cut, hung, air dried, and smoked.

During late spring and summer, small starry flounders and sculpins were caught in nets set for herring and salmon. Both fish species frequented the Stebbins coastal vicinity throughout the year. A few families dried sculpin and flounder, but most families retained only enough for a few meals of fresh fish and did not keep the remainder. Both varieties of fish were considered too small and bony to compensate for preservation labor requirements.

Along the rivers south of Stebbins during summer, several fish species could be taken in moderate numbers--sheefish, broad whitefish, round whitefish lush, trout, and grayling. Families with fishcamps along these waters typically utilized small quantities of each type of fish.

During August many families gathered berries on Stuart Island and in the tundra south of the village to Point Romanof, some households

establishing berry camps for a few days. As on the delta, varieties included salmonberries, blackberries, blueberries, and lowbush cranberries. At this time, families frequently set nets to harvest a large late summer or early fall run of Bering cisco in small sloughs and coastal rivers. A net set for a few hours sometimes would take hundreds of fish. One or two families used cheesecloth seines to harvest "needlefish" (sticklebacks) abundant during August.

From mid August until the freezeup of sea ice marked a second period of intensive sea mammal hunting. Adolescent bearded seals, ringed seals, and spotted seals were hunted from boats in open water surrounding Stuart Island, and south along the coast to the Pastolik River mouth. Seals were shot and harpooned from skiffs generally holding a two-man crew. Concurrently, belukhas could be captured in the same areas. Fall seal meat frequently was dried; the fat was rendered into oil for winter use. Following freezeup, bearded and ringed seals still were occasionally taken from ice pack breathing holes. Spotted seals were rare during late fall and winter months. As on the delta, adult bearded seal hide was used for the soles of boots and for thong strips used as binding for sleds and snowshoes. 'The skins of ringed, spotted, and young bearded seals were used as material for boots, parkas, rugs, and other handcrafted items.

Fall also marked a second period of waterfowl hunting from Stuart Island, south along the coastal tundra to Point Romanof. During this time, large runs of saffron cod were harvested from coastal rivers and

sloughs with short gill nets of about 3-inch stretch mesh. A few families set basket traps for round whitefish. Saffron cod were harvested throughout late fall and into winter. After freezeup, large quantities were taken by hooking through the ice. Smelt also could be taken at this time, but were utilized primarily as bait for saffron cod. Before freezeup, about a bucket of blue clams and mussels might be dug at low tide from the beaches near Stebbins by families, enough to 'provide variety to the diet."

Winter and spring marked relatively slack periods for fishing and hunting activities, as on the Yukon delta. Some hunters harvested fur bearers such as fox, beaver, otter, and an occasional mink in the areas south and west of the village, especially along the Pikmiktalik River. Harvest techniques were similar to those of Kwikpagmiut communities. Unlike delta communities, Stebbins people did not maintain nets or traps under the ice for fish during winter, except for a few blackfish traps on the tundra near the village.

From about January through March, small groups of hunters periodically might make hunting trips by snowmachines south into the Andreafsky Mountains in search of moose. Based from hunting camps, these excursions might take from several days to a week, and cover the area from the Gosolvia River south to the headwaiters of the Pikmiktalik. Hunters from Pilot Station and St. Mary's occasionally were encountered hunting in the same region. As on the delta, the one or two moose taken by the

group typically were divided and distributed widely within the winter village.

Stebbins Corporation maintained herds of domestic reindeer, one which grazed on Stuart Island, the others in the Andreafsky Mountains. By and large in 1980-1981, these herds were left unattended. Reindeer were not supposed to be killed without corporation permission and reportedly were occasionally allowed to be taken for special events or sale at the local store. Reportedly, in recent years the herd on Stuart Island was being utilized at very low levels. The Andreafsky Mountain herds were in a semi-wild state, and according to certain Stebbins residents, were mistaken for caribou by hunters from other communities.

During winter, Stebbins families primarily utilized food products put up during spring, summer, and fall, supplemented by staples purchased at the two village stores and a few hares and ptarmigans. With the approach of March, and the start of seal hunting for fresh meat and oil, the annual round of fishing and hunting activities began anew its yearly cycle.

Marketing and Wage Employment

The second major sector of the regional economy during 1980-1981 which complemented fishing and hunting for local consumption, was the "market" sector, or "commercial" sector. Engaging in wage and market

activities was not a historically new component in the Kwikpagmiut economy, but existed even in the earliest historic accounts of the Yukon delta (Wolfe, 1979). An expansion of fishing for salmon and trapping and hunting for fur bearers for market sale has occurred since historic contact. This expansion is attributable to two factors: the emergence of export markets for salmon and furs outside the region, and increased local demands for imported goods. Increasing reliance on imported fishing and hunting equipment? especially fish nets, boat motors, and snowmachines, has elevated the importance of the market sector of the Kwikpagmiut economy.

The "subsistence" component of the economy (fishing, hunting, and trapping for local consumption and exchange) and the "commercial" component (production for sale on external markets) were well integrated by the Kwikpagmiut during 1980-1981. "Subsistence" and "commercial" pursuits were frequently not discrete or separate activities. The production of salmon for export sale or local consumption required the same equipment and could be done simultaneously. The hunting and trapping of fur bearers often was engaged in while checking traps and nets for fish species. Furthermore, the 'subsistence" and 'commercial" activities were rarely antagonistic or contradictory. In fact, they commonly supported one another. Fishing and hunting for local consumption and trade required a flow of cash capital; fishing for market sale, and wage work, commonly provided the source of this capital. The most successful producer in the economic system was one who brought in a steady monetary income and reinvested a portion of it into fishing

and hunting for local consumption. In this manner, the two sectors became mutually supportive (see Wolfe, 1979).

The major sources of monetary income on the Yukon delta were commercial salmon fishing, seasonal wage employment, fur sales, and income assistance. At Stebbins, where only seven households held commercial salmon permits, an emerging source of monetary income was commercial herring fishing. Each fishery is described in general terms below, while harvest statistics are presented in Chapter 4.

The largest and most consistent source of monetary income to the study area was the sale of commercial salmon. During 1980 there were twelve commercial processors of salmon operating on the lower Yukon River. Most of the salmon was processed as a fresh or frozen product; smaller quantities were canned or hard salted. Two of the commercial processors were owned by local native corporations--the Yukon Delta Fish Marketing Co-op, Inc., at Emmonak, and the Azachorak Corporations Village Cannery at Mountain Village. These two corporations, and the others to a lesser extent, provided seasonal wage employment to residents of the region, in addition to income from salmon sales. Each corporation-owned processor estimated it employed from 60 to 80 persons at peak production during the summer. About 80 percent of the employees were local residents at the Emmonak facility; about 20 percent at the Mountain Village processor. Other employees were drawn from other local communities, such as Hooper Bay, Chevak, and Kuskokwim River villages. Processor employees in general were young adults.

The larger buyers of salmon operated as lending institutions for commercial salmon fishermen. Most loaned out money, fuel, or equipment (such as nets, motors, or parts) at the beginning of the season as operating capital for a fisherman. It was estimated that on the average, a fisherman might take between $1,000 to $2,000 in loaned equipment and supplies before the salmon season began. Fishermen paid off these loans with salmon earnings.

There were 403 commercial salmon gill net permits owned by members of the six study communities of the lower Yukon delta (Districts 334-10, 334-20, 334-30), out of a total of 686 registered in the three districts (ADFG Annual Management Report, Yukon Area, 1980). As indicated earlier, most fishermen used set or drift gill nets, from skiffs between 17 and 25 feet in length, powered by outboard motors (35 to 55 horsepower), without gill net rollers or power reels.

On the average in 1980 in the lower Yukon district, king salmon sold for $23.41 per fish, chums $1.66 per fish, and cohos$2.32 per fish. The 1980 commercial catch on the lower Yukon River was 143,853 kings, 950,355 chums, and 7,488 cohos, sold for an estimated value of $4,962,559 or an average of $'?,234 per permit holder. This comprised about 75 percent of the total 1980 Yukon River fishery output. For the entire Yukon River, gross value of salmon sales to fishermen was $6,703,100; wage income from salmon processing was $1,475,000; for a total of $8,178,100. The wholesale value of the salmon was

,$16,757,700. (Figures were derived from the ADFG Annual Management Report, Yukon Area, 1980.)

For most households, commercial salmon income represented the largest and most consistent source of money. As shown in Chapter 4, for a sample of 88 households, commercial salmon earnings comprised 45.8 percent of their annual monetary income, or $8,026 per household, during the period June 1980 to May 1981.

The commercial herring fishery at Stebbins was relatively new in 1981, being in its first few years of operation. Herring was sold for its roe to floating processors which moved north along the western Alaska coast with spring herring migrations, buying fish within various fishing districts. During 1981, processors sometimes brought fishermen with them to harvest herring. These nonlocal fishermen were perceived by some resident fishermen as unfair competition for a local resource. Some residents expressed a desire that the district have limited entry restrictions to protect the earnings of local fishermen.

It was reported that average earnings for local fishermen who fished commercial herring at Stebbins during 1980 was between $2,000 and $3,000. Of the twelve sampled Stebbins fishermen discussed in Chapter 4, average earnings for the four who sold commercial herring was $1,318. During 1981 the average earnings for fishermen probably increased. Fishermen were adjusting to the system of open periods and several had purchased on credit 7.3 meter open boats from the Stebbins Native Corporation which allowed larger production capacity. One

fisherman reported that he earned $7,800 during the three 12-hour open periods in 1981, $5,000 which would go toward his new $15,000 boat. Fishermen by and large expressed satisfaction with the development of the commercial herring fishery. Stebbins has been a "cash-poor" community in recent years, especially because many families had been denied commercial salmon limited entry permits within the Yukon delta district and no longer could fish commercially during summer. Herring sales at Stebbins held the promise of becoming a relatively consistent source of income for the community.

Seasonal employment was a second source of income for many families in the Yukon delta region. Job opportunities on the Yukon delta were generally of a seasonal nature. The most common sources of employment were in commercial salmon processing mentioned above, or in construction work, such as ASHA and BIA-HUD housing, Alaska village development projects, and regional high school construction. Other sources of employment were in city council government, city government, retail stores, regional schools, and the BIA educational system.

Paid employment frequently was integrated with commercial fishing and food production for local consumption, although at times this entailed scheduling conflicts. If a person% employment hours were relatively inflexible then other economic activities had to be conducted around them. Some forms of employment, such as city government, allowed more flexibility. Such positions might be filled during closed commercial salmon periods, and vacated during open fishing periods. Some

households avoided scheduling conflicts by having one household member work, while others fished and hunted.

The eighty-eight sampled households described in Chapter 4 averaged $7,878 in paid employment during the period June 1980 to May 1981. The wage income comprised 40.7 percent of their annual earned monetary income. The average wage income for the sample probably is higher than the delta as a whole, as is discussed in Chapter 4, because households with wage employment probably were disproportionately represented in the sample.

The other sources of income were fur sales and Federal and State income assistance. Fur sales provided on average about $1,000 to a household, although some trappers earned considerably more. Red fox and mink were the region's primary marketable pelts. The most common form of income assistance was food stamps. Families frequently qualified for food stamps during winter months, when sources of monetary income disappeared. The other common form of income assistance was aid to dependent children. Of the eighty-eight sampled households discussed in Chapter 4, fur sales comprised 5.7 percent of their annual monetary income, while income assistance comprised 9.5 percent during the period June 1980 to May 1981.

The Cost of Living on the Yukon Delta

Maintaining a consistent source of monetary income was essential because of the high cost of living on the Yukon delta. Major costs included technological items used in food production, oil and gas for fuel, and food. The high costs can be illustrated with a few case examples.

During 1981 fuel for boats was selling for $2.08 to $2.50 per gallon unmixed ($3.00 per gallon mixed at Alakanuk in late July 1981). During a fishing season, a commercial drift netter might expend about ten 55-gallon drums of fuel, or about $1,155 if purchased at $2.10 per gallon. Heating oil cost $98 or $102 per 55-gallon drum. One Alakanuk family estimated the following costs for heating and electricity during a year: stove oil, sixteen drums at $102 per drum; propane, four drums at $99 per drum; electricity 9 winter months at $75 per month, and 3 summer months at $52 per month; totalling $2,859 per year.

Maintaining a full complement of fishing and hunting equipment incurred substantial payments. In 1976 it was estimated that owning and main. taining a wooden boat, 35-horsepower motor, snowmachine, nets for kings, chums, sheefish, and small whitefish, .22 rifle, .222 rifle, and shotgun would cost $2,133 per year (Wolfe, 1979). This was figured by depreciating the equipment's current market value by its life expectancy, plus annual maintenance costs. Recalculated with 1981 prices,

the cost to own and maintain a full complement of fishing and hunting equipment totalled about $3,648 per year.

The high food prices at stores in the bush of Alaska are well known. Table 3 illustrates prices for typical food items at a store in Emmonak in 1981. Meat products averaged about $4.62 per pound. (See Chapter 4.)

Because of high costs of imported foods, most families were forced to fish and hunt for food. The limited monetary incomes of a household were not sufficient to enable a family to live solely on items purchased from local stores. The most efficient use of limited cash income was to invest a portion into equipment and operating costs for fishing and hunting. This money, coupled with a person% labor, produced a higher food return than was possible if an equivalent amount were spent on imported foods (Wolfe, 1979). For most families on the Yukon delta, this was the only viable strategy for survival.

Effects of the Commercial Fishery

The commercial export fishery for salmon has developed gradually in the Yukon delta region. As documented by Pennoyer, et al. (1965), commercial fishing for salmon was introduced during 1918 when a floating cannery was operated at Andreafsky (St. Mary's). A below-normal upriver salmon catch during 1919 was attributed to unregulated commercial fishing and led to a curtailment of salmon fishing for export sale

Table 3

FOOD PRICES AT EMMONAK, JUNE 1981

FRESH FROZEN MEAT	PRICE/LB.
Chicken legs	$2.91
Sliced bacon	4.09
Beef hearts	4.15
Pork spare ribs	4.69
Bol ogna	4.70
Beef tongue	5.09
Sal ami	5.30
Chuck roast	5.55
Stew beef	5.65
Pork chops	5.75
Beef top round	6.55
T-Bone steak	9.65
New York steak "	11.89
CANNED MEAT	
Beef stew	1.70
Corned beef hash	1.97
Meat balls	2.23
Vienna sausage	3.04
Light tuna	3.82
Spare	3.95
Sardines	6.36
OTHER PROTEIN	
Cheese	3.29
instant dried milk	2.57
Canned evap. milk	.95
Eggs, dozen	1.85
Peanut butter	3.25
OTHER PRODUCTS	
Sugar	.91
Margarine	1.59
Crisco shortening	1.63
Salt	.42

CEREAL PRODUCTS	PRICE/LB.
Flour	$.62
Rice	1.06
Pasta	1.21
Pilot bread	1.55
Corn flakes	2.81
Quaker oats	1.47
Sandwich bread	1.33
CANNED VEGETABLES	
Pork and beans	.80
Peas	1.01
Corn	.99
Green beans	.98
Tomatoes	1.07
Carrots	.89
Chili with beans	1.70
CANNED FRUITS	
Applesause	1.19
Peaches	1.17
Pineapple	1.14
Grapefruit	1.25
Pears	1.30
BEVERAGES	
Coffee, ground	4.%?
Tea	8.70
Tang	2.22
FRESH FRUITS AND VEGETABLES	
Oranges	1.39
Apples	1.59
Potatoes	.82
Tomatoes	3.09
Lettuce	1.59
Carrots	1.29
Bananas	1.59

between 1925 and 1931. After 1932, commercial sales of salmon to outside buyers was reintroduced and gradually expanded under a monitored program. The largest commercial catches and sales of salmon have occurred during recent years (ADFG Annual Management Report, Yukon Area, 1980).

The development of commercial salmon fishery has occurred in association with other changes in the economy and culture of the region. Some of these associated changes are outlined below--changes in demography and the mixed subsistence-market economy. Without firmer historical data, one cannot with confidence document the magnitude of these changes, nor attribute them solely to the development of commercial fishing. Nevertheless, it is probable that these changes in the economy and culture were influenced by the presence of commercial fishing.

First, it is probable that centers of population and locations of commercial salmon processors have exerted reciprocal influences. The largest historic summer population densities occurred along the south pass of the Yukon due to large salmon runs in that area. It was logical that many early commercial firms tended to locate canneries, salteries, tenders, and floating freezer ships there also. As commercial firms offered markets for fish and opportunities for seasonal wage employment, they represented a further attraction to the vicinity for fishermen and seasonal workers. This may have led to larger summer populations due to immigration to the vicinity, and perhaps a greater consolidation of the area's winter population. Current firms were

located nearby large winter communities--Yukon Delta Fish Marketing at Emmonak, Bering Sea Fisheries and Schenk Seafood Sales, Inc., near Emmonak, Whitney Fidelgo Seafoods near Alakanuk, Azachorak Corporation Village Cannery at Mountain Village, and Boreal Fisheries near St. Mary's. Reportedly, the winter population of the north pass (Kotlik and historic Chaniliak and Pastolik) over time have established summer fishcamps closer toward commerical firms to enable fishermen to sell fish. Similarly, several fishermen from Stebbins and Scammon Bay travel to the Yukon delta area to commercial fish. This is not to say that commercial fish processors were the primary causes of the consolidation trends of the summer and winter populations. Other institutions such as public schools, churches, retail stores also attracted people and perhaps were of' greater importance.

The commercial fishery also caused a certain degree of summer immigration from outside the region, although not nearly to the extent of the fishery at Bristol bay. The Yukon delta fishery manpower predominantly were of local origin during 1980-1981. Three of the largest firms (Bering Sea fisheries, Inc., Whitney Fidelgo Seafoods, and Schenk Seafood Sales, Inc.) imported a major portion of their work forces. Some workers in the other processors as mentioned previously, came from outside the region for summer employment. Other summer immigrants were Fish and Game biologists monitoring and managing the fishery, and Fish and Wildlife Protection officers.

A second category of effects of the development of the commerical salmon fishery are economic changes. As mentioned previously, the commerical fishery has become a constant source of monetary income to the area. For most households, the money was used for both investment capital into subsistence fishing and hunting, and as money for purchasing basic supplies such as imported food, clothing, heating oil, and other household goods. The large output of subsistence foods in the region today (documented in Chapter 4) was supported by the development of income from commercial fishing.

The commercial fishery offered limited seasonal wage employment opportunities. Processing jobs such as hauling, cutting, icing, or canning salmon primarily attracted young adults in the late teens and early twenties, especially females. Assembly line processing jobs were not considered to hold as high prestige as fishing nor did they pay as much. The Village Cannery at Mountain Village reportedly had to hire nonlocal workers because summer fishing attracted most of the local labor force. Adult men tended to hold the managerial and supervisory positions in the firms. Collector boats generally were piloted by Young adult men. As most jobs related to the commercial buying and processing of fish did not offer as much potential income as fishing, most were held by persons who could not commerical fish, especially persons without commercial limited entry permits. It can be predicted that these limited job opportunities will be more in demand in the future as the region's large population of children reaches adulthood

without opportunities for many to obtain commercial limited entry permits.

One potential limitation with summer wage employment was that a person was tied to the winter village during summer, These workers were not as free to move to summer fishcamps as persons without such employment. A worker's time also was taken up by remunerative work, restricting a person% ability to catch and process salmon for subsistence uses. In general, if workers were unmarried young adults, these restrictions on mobility and time did not reduce a householders capacity to subsistence fish during summer. As illustrated in the eases in Chapter 2, some households at fishcamp left children at the main village working at commercial firms. Another strategy was for men to fish at a fishcamp, while the remainder of the household remained at the winter village. Thus, while a household could maintain its subsistence output, there was some cost in the form of temporary separation of household members. When an adult married and/or assumed a major role in the harvesting and processing of salmon for the household unit, the ability to coordinate the work demands of summer wage employment with those of subsistence fishing becomes increasingly difficult. It seems likely that older married adults tended to quit processing jobs because of this competition with the subsistence needs of the family.

Most income from the commercial fishery entered the regional economy through the fishermen with commercial fishing permits who caught salmon for sale to processors. As indicated earlier, commercial salmon

fishing had become well integrated with the historic pattern of fishing and hunting for local consumption. Fishing was a traditional summer economic activity and fishing for commerical sale did not represent an occupation competing with or redirecting the summer economic focus of producers.

A major influence of the commercial salmon export industry on the subsistence fishery has been in terms of increased regulations of salmon fishing. A complex system of regulations to limit commercial harvests has supplanted the traditional autonomy of the Yukon delta fisherman. Previously, the times fished and quantities taken were self-regulated by a production unit, usually consisting of an independent nuclear or extended kinship group. Under present regulations, the previously independent Kwikpagmiut fisherman was drawn into a larger system whose components, still the producing kinship groups, were interrelated. The harvest level of the entire system was monitored and regulated by state fish and game personnel. The harvests of a neighbor could affect one's own by influencing short term quotas and the lengths and times of open fishing periods.

Since the 1930s, the Kwikpagmiut salmon fishing activities have been constrained by legal regulations. Fishing regulations have placed limits on the size of commercial catches and lengths of open fishing periods. Before 1961, fixed quotas were established to set a ceiling on the seasonal take of commercial salmon for export. Quotas were eliminated in 1961 for a more flexible system of scheduled weekly

fishing periods. During 1980 to 1981, fishermen were cognizant that open fishing periods had shrunk over time. During 1981, fishing was restricted to only two 24-hour open periods per week for most of the season. Whereas in the past subsistence fishing could occur at any time, now it was restricted to 48 hours a week.

The schedule of periods has tended to mold fishing activity into relatively short bursts of concentrated effort rather than moderate effort extended over a longer time frame. As it currently operated, the short time periods seemed to give advantage to fishermen capable of rapid mobility and short term, high level labor expenditures. Rapid mobility allowed fishermen to relocate from unproductive to more productive sectors of the river during an open period. Drifting was the preferred harvest method for a highly mobile fisherman if river conditions permitted. Set net locations fostered sedentism (see Chapter 8). One negative aspect of high mobility and drifting as a technique was increased monetary costs in gasoline and equipment wear in comparison with set netting. Thus, potentially higher harvests were offset to some extent by increased expenses.

The shorter open periods clearly have influenced summer residence patterns of some households, as illustrated in Chapter 2. Within certain households, only male fishermen established residence at fishcamps during open periods, returning to the winter community during closed periods. In other households, considerable movement occurred

between summer fishcamps and winter communities during extended closed fishing periods.

Other regulatory constraints in addition to fishing periods included restrictions on gill net mesh size, net lengths, and net locations. By and large, these regulations seemed to be understood and followed by most fishermen. Nevertheless, increased regulation has led to explicit comparisons of local fishermen's perceived interests with outside interests. Poor fishing seasons commonly were attributed by fishermen to fishing regulations, especially to closed periods which allowed what were perceived to be substantial runs of fish to escape upriver,

Geographic Patterns of Resource Utilization

Utilization of local resources of the land, rivers, and the sea was the foundation of the economy of the Yukon delta region. This section presents information illustrating some of the geographic locations of harvest efforts by a sample of Kwikpagmiut and Tapraqmiut households during the period June 1980 to May 1981. The purpose of this section is to describe in general terms some of the geographic domains utilized by the people of the Yukon delta region in economic production,

Information concerning the geographic locations of fishing, hunting, trapping, and food gathering activities was gathered during systematic discussions with a sample of Yukon delta households (see Chapter 4 for sample characteristics and selection procedures). As part of extended

discussions about fishing, hunting, trapping, and food gathering activities, household heads were asked to indicate on United States Geological Survey topographical maps areas in which they fished or hunted for particular food resources during the previous year. This information has been compiled and summarized in the following maps to illustrate areas utilized by particular individuals in certain economic activities during the previous year. The information should not be considered a complete, or exhaustive depiction of land, river, and sea use patterns by people in the region. Instead, the maps only illustrate some of the fishing and hunting locations of a sample of household heads, and their families, during a one-year period. According to the reports of' residents, certain fishing, hunting, and trapping locations commonly change from year to year. Consequently generalizations made from this limited data base must be considered tentative and merely suggestive of land, river, and sea use patterns in the study area. Mapping of resource uses stretching farther back than one year might reveal substantially wider land use patterns, as might mapping of future resource use patterns longitudinally.

Salmon Fishing Locations

The general areas within which salmon was harvested by fishermen from Alakanuk, Emmonak, Kotlik, Mountain Village, Sheldon Point, and Stebbins during the summer of 1980 are depicted in Figure 6. The figure illustrates that the entire length of the Yukon River within the study area, from the coast upriver about 100 miles, was fished to some extent

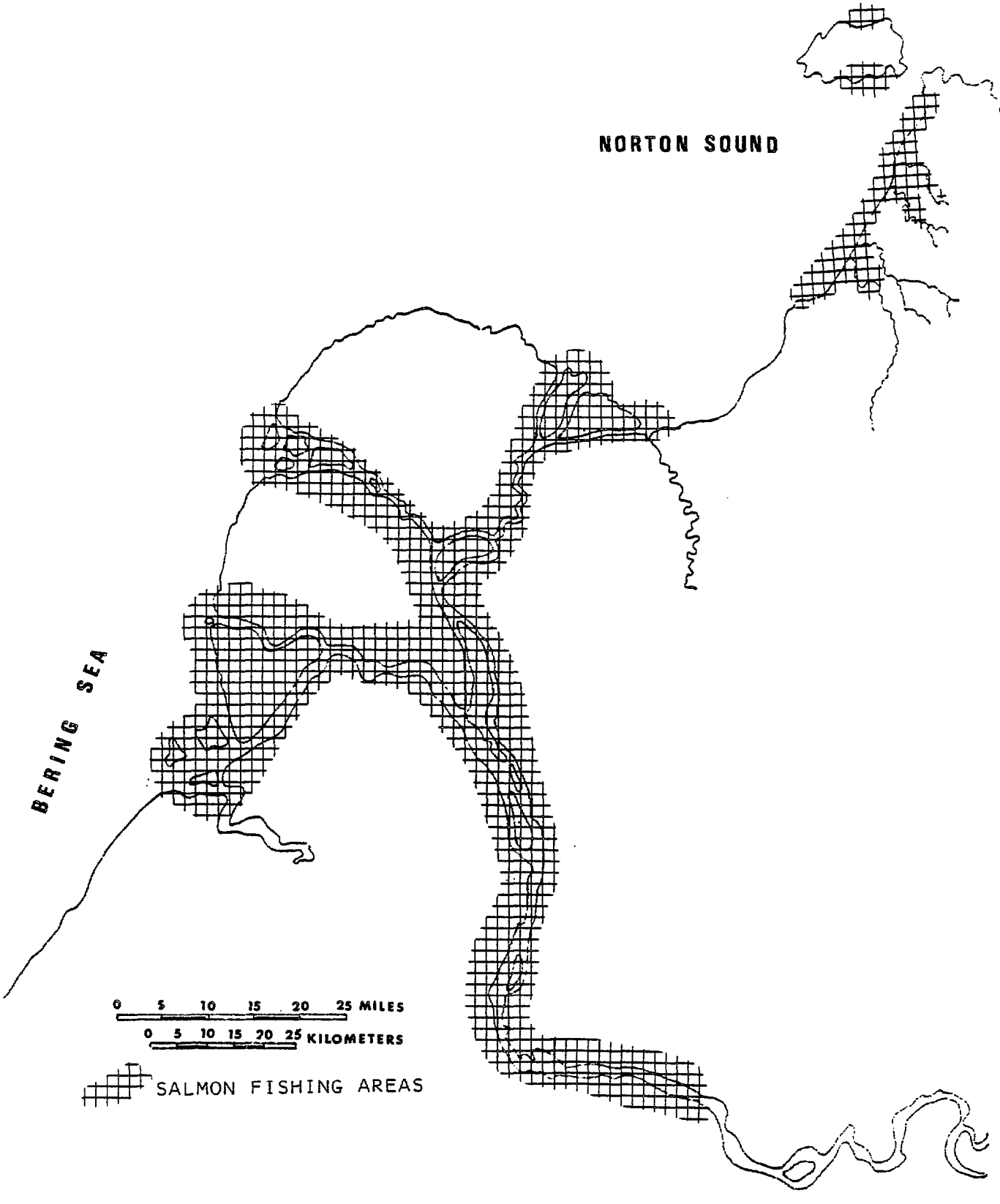


Figure 6. Approximate areas for salmon fishing during 1980 by residents of Alakanuk, Emmonak, Kotlik, Mountain Village, Sheldon Point, and Stebbins

for salmon. As discussed in Chapter 2, the region's population dispersed during summer months along the banks of the main rivers, sloughs, and distributaries of the delta to harvest migrating salmon. Fishing effort typically occurred near a fisherman's fishcamp; thus the locations of fishcamps are good indicators of the areas fished. Nets were set at the mouths of the delta's three major passes, the Kwikluak, Kwikpak, and Apoon, and smaller passes, Kwemeluk, Alakanuk, Kwiguk, Kawanak, and Okwega. In past years, the Bugumowik Pass was also fished. Drifting gill nets was more frequently done upriver away from the coast, especially along the main river upriver from the head of the three main Yukon delta passes.

Fishermen from Stebbins placed nets along the coastline of southern Norton Sound, from about Point Romanof north to Stuart Island. Nets were placed along the coastline of Stuart Island as well. Rivers harvested for salmon in this region included the Pikmiktalik, Nunavulnuk, Kogok (Nunakok), and Kuiak.

It should be mentioned that salmon fishing near the mouth of Black River (Kipneak) by Scammon Bay fishermen, and fishing upriver from the study area, are not depicted in Figure 6.

Seal Hunting and Belukha Hunting

Two major geographic patterns existed for seal and belukha hunting in the region, a "fall" pattern and a "spring" pattern, depicted in Figures

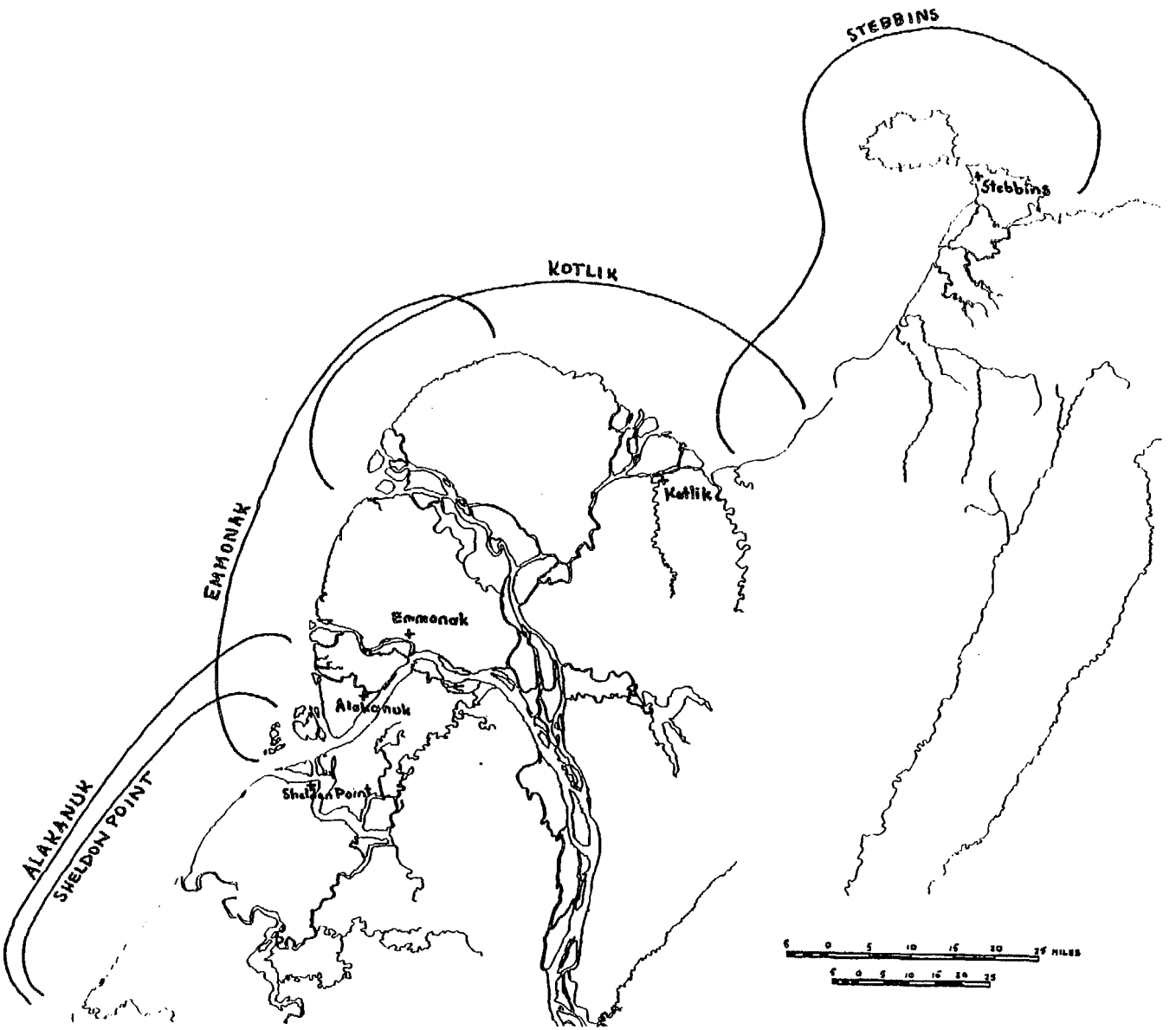


Figure 7. General fall seal and belukha hunting areas during 1980 for hunters from Alakanuk, Emmonak, Kotlik, Sheldon Point, and Stebbins, from a sample of 72 households

7 and 8, respectively. During late summer and fall, before the freezeup of the Yukon or coastal waters, hunters searched for seals and belukhas by boat along the coasts surrounding their winter communities. The general areas covered during "fall" are shown in Figure 7. In general, Stebbins hunters covered the area from about Egg Island southwest to the Pastolik River mouth, including the area surrounding Stuart Island. Kotlik hunters typically hunted from about Coffee Point west to the middle mouth. Emmonak hunters covered the area from north of middle mouth south to Flat island. Some Emmonak hunters traveled as far as Black River to hunt. Alakanuk hunters searched for sea mammals from just north of Alakanuk Pass south to the mouth of the Mukunoaliwik River. Sheldon Point hunters covered the area from about Flat Island south to the Mukunoaliwik River. Searching for sea mammals frequently took hunters 10 to 15 miles from shore, beyond the sight of land.

In addition to these coastal waters, seals were harvested in the Yukon River. Mountain Village hunters watched for seals swimming in the rivers, and during fall, frequently traveled to the coast to hunt seals. Of sixteen households questioned, nine captured seals during 1980--two on the main Yukon River, three at middle mouth, two at Kotlik, one at Scammon Bay, and one at Hooper Bay (see Chapter 7).

During late winter and spring, hunters for seals usually traveled directly out from their winter villages onto the shore-fast ice pack to open lead areas. Seals were harvested along the edge of the ice pack, as depicted in Figure 8. The edge of the fast ice area varied, but

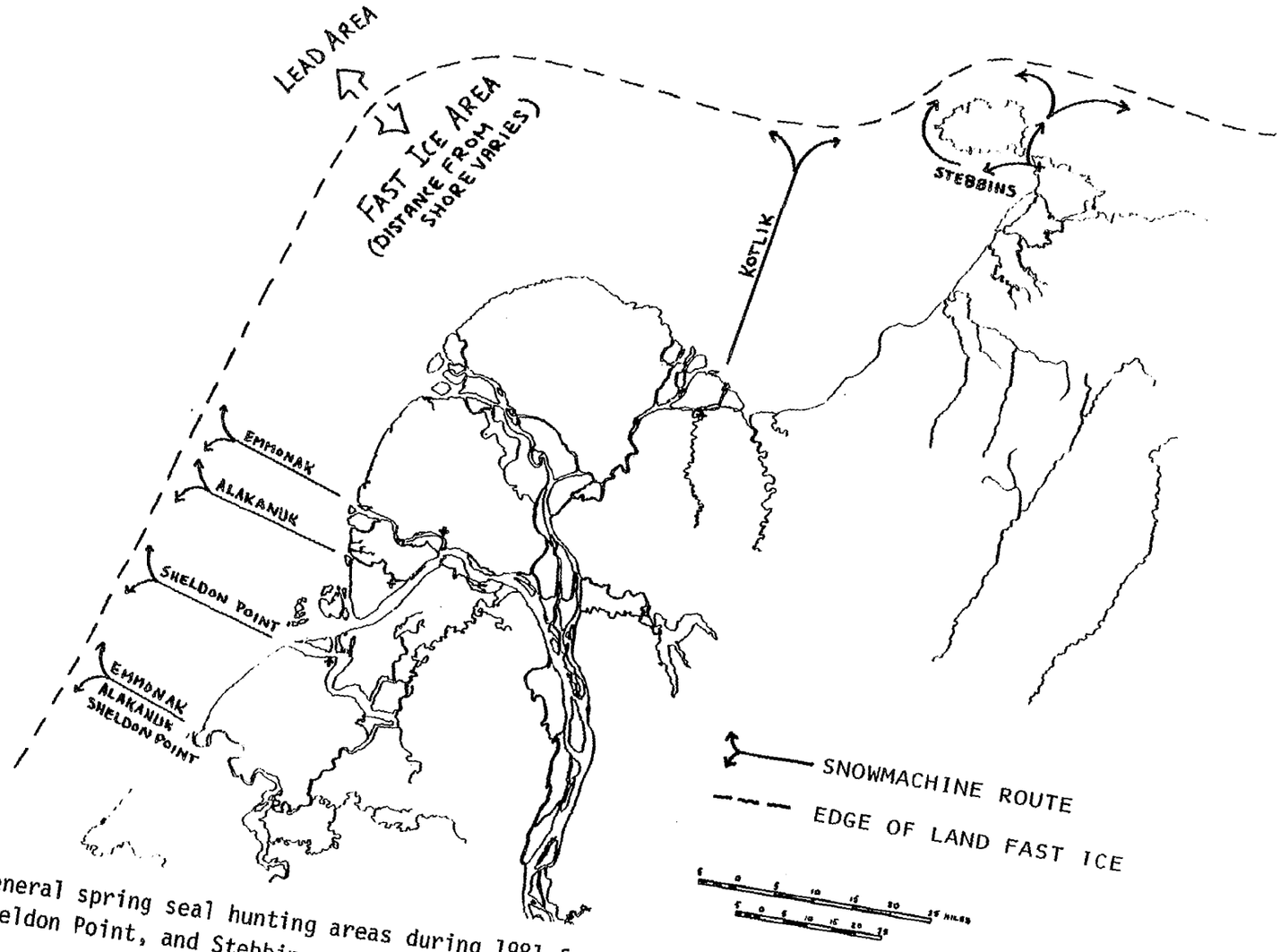


Figure 8. General spring seal hunting areas during 1981 for hunters from Alakanuk, Emmonak, Kotlik, Sheldon Point, and Stebbins

hunters stated that distances were not uncommonly 30 to 40 miles from the Yukon delta coastline. Stebbins hunters usually did not have to travel as far to encounter open water. During spring, hunters from Emmonak, Alakanuk, and Sheldon Point sometimes searched for seals off the mouth of Black River.

Non-salmon Fish Species

Figures 9 to 17 depict the fishing locations for certain non-salmon fish species for the period June 1980 to May 1981, of a sample of households from each winter community. The map notes general locations where a net, trap, seine, or other fishing gear was utilized at some point during the previous year by a household. Most fishing effort for non-salmon fish species occurred near the winter villages. Exceptions included pike fishing near Kusilvak Mountains (Figure 16), and whitefish fishing along the Black River (Figure 14 and 17). In general, nets for sheefish, smelt, lamprey, and burbot were used in the main Yukon River passes; nets for broad whitefish were placed on rivers or sloughs draining into the main Yukon (except at Mountain Village where they were placed on the main river); nets for small whitefish were placed on or near small rivers draining into the ocean (except again at Mountain Village); and blackfish traps were set in tundra lakes and streams.

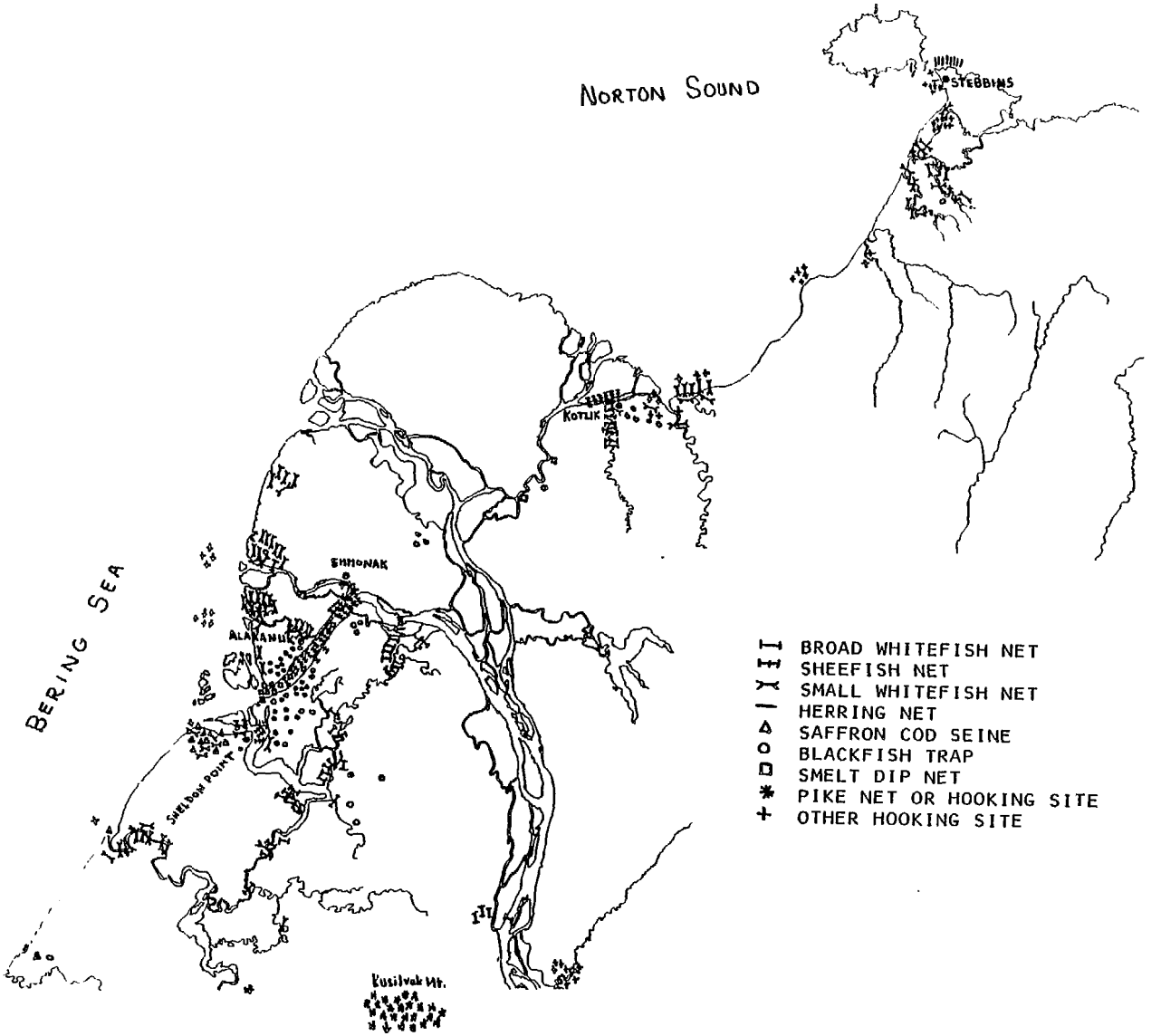


Figure 9. Fishing locations for non-salmon fish species, June 1980-May 1981, based on a samp e of 88 households from Alakanuk, Emmonak, Kotlik, Mountain Village, Sheldon Point, and Stebbins. (Mountain Village locations partially shown. See Figures 10-17.)

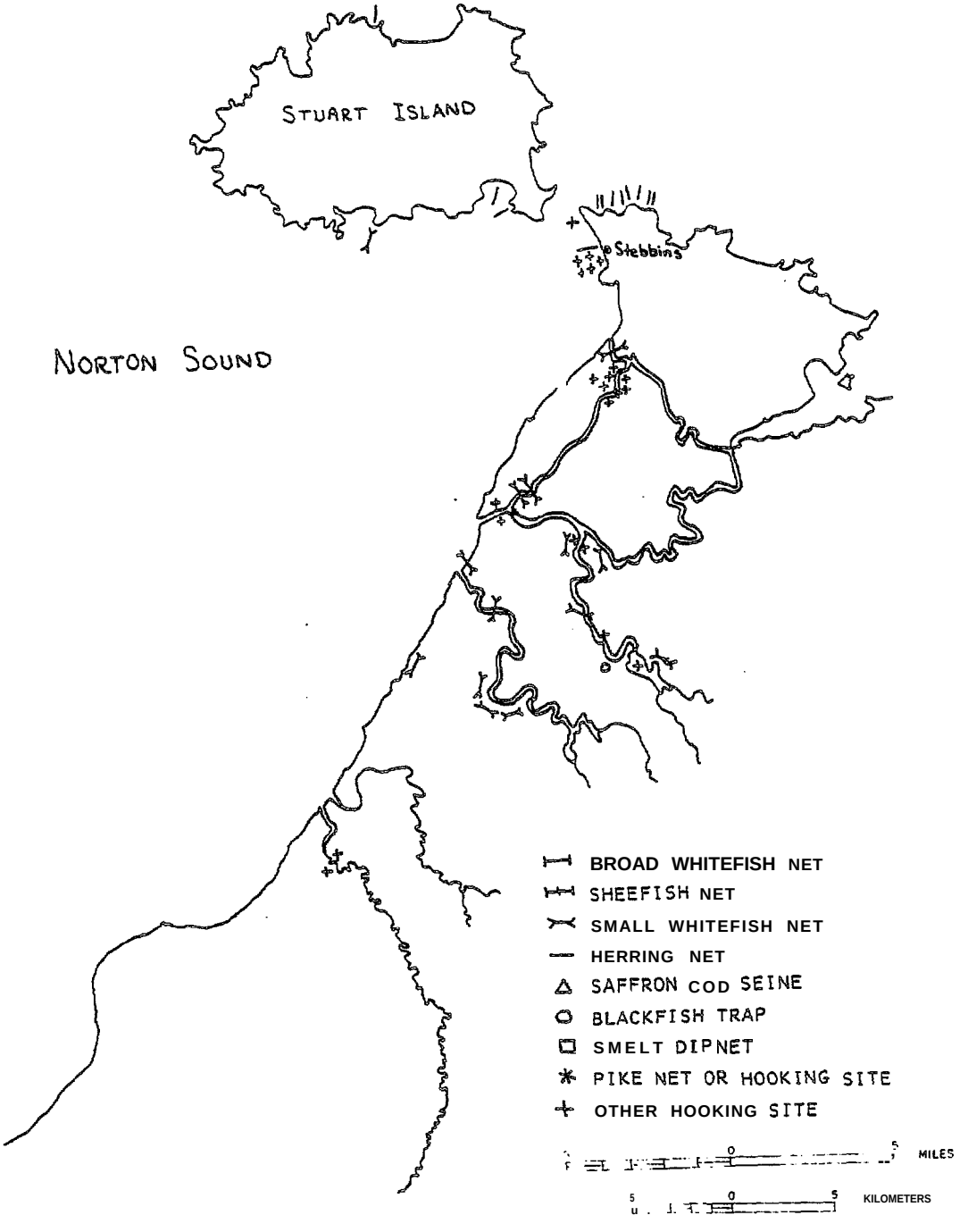


Figure 10. Fishing locations for non-salmon fish species, June 1980-May 1981, of a sample of households from Stebbins (n=12)

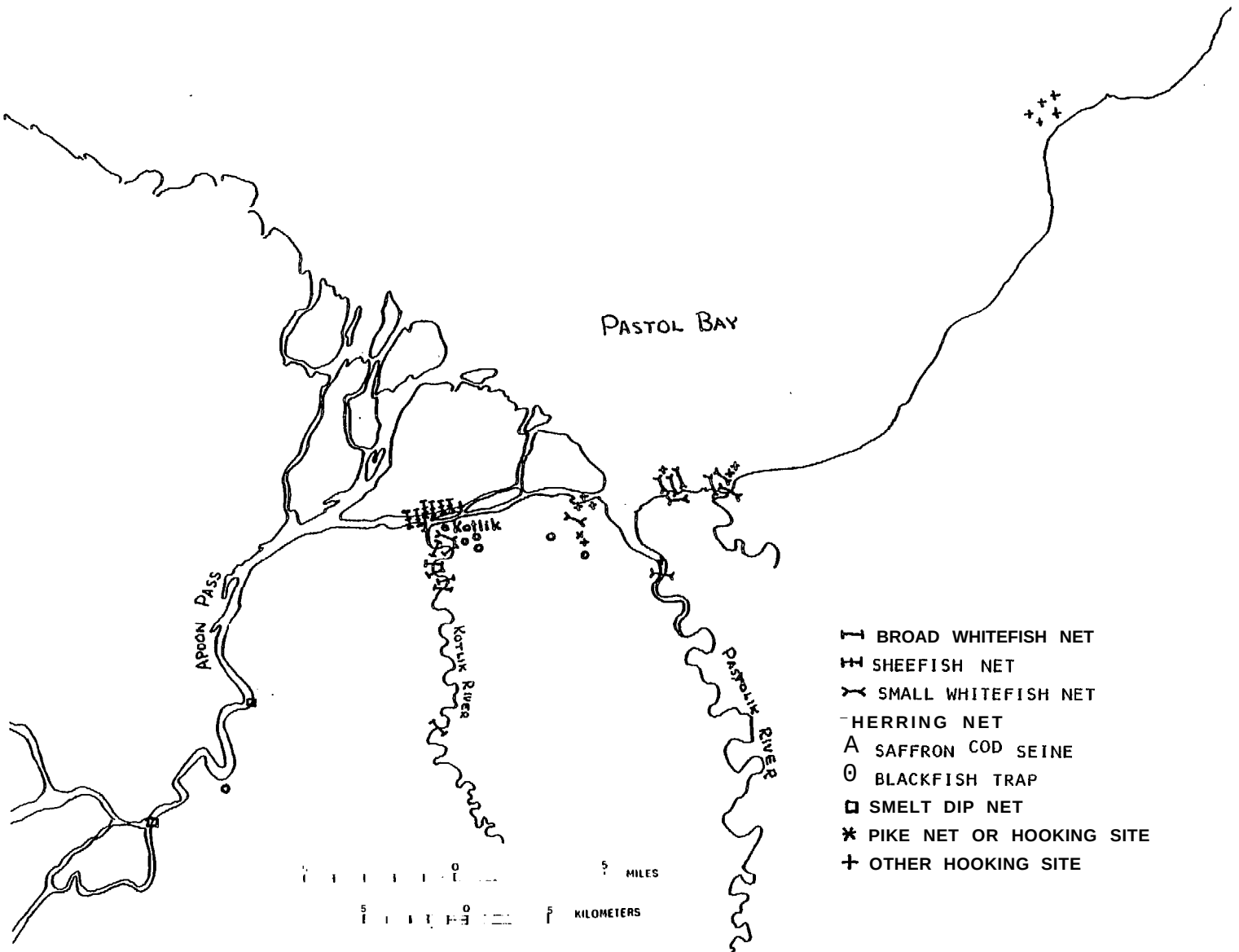
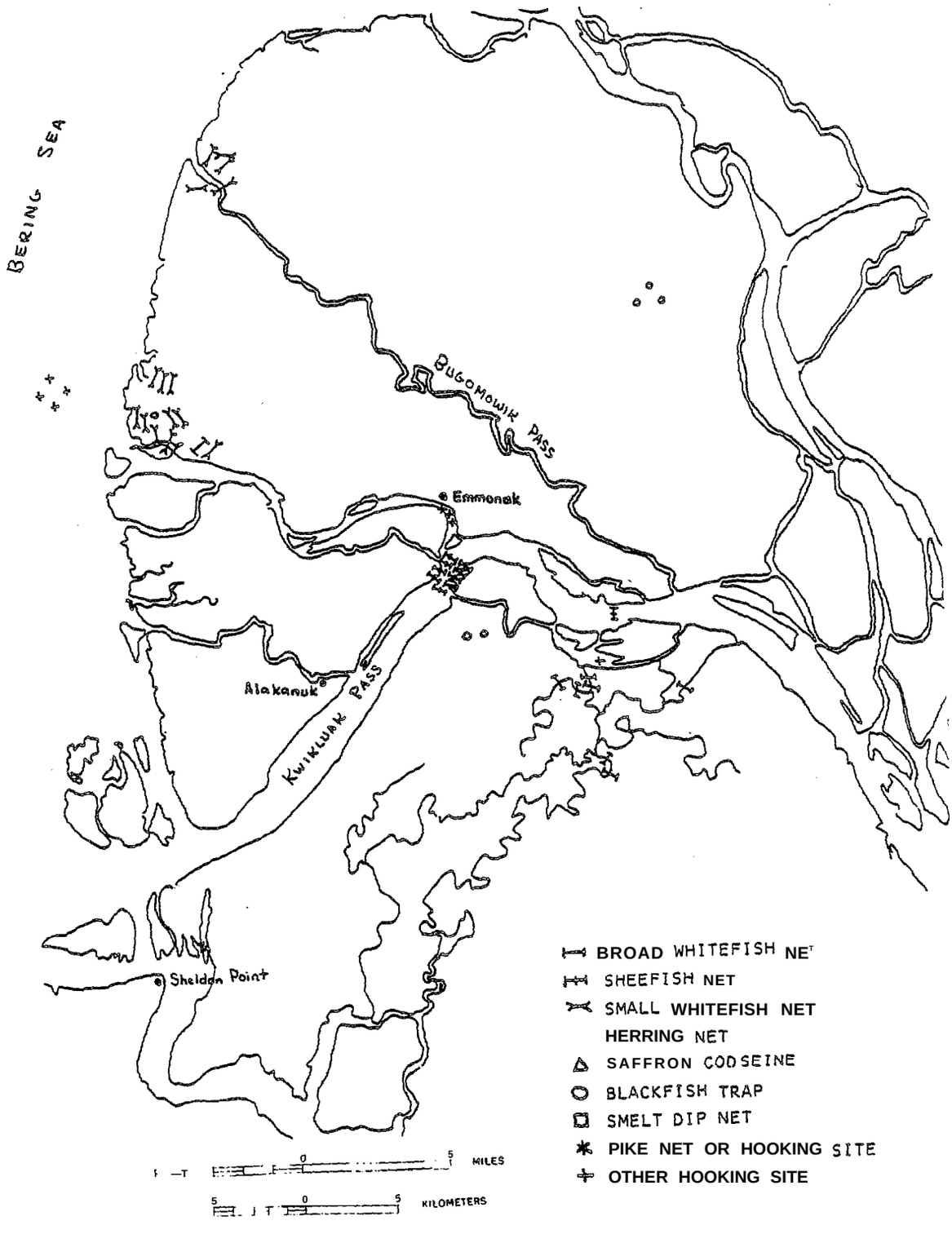


Figure 11. Fishing locations for non-salmon fish species, June 1980-May 1981, of a sample of households from Kotlik (n=14)



June 1980-May 1981,

Figure 12. Fishing locations for non-salmon fish species, of a sample of households from Emmonak (n=18)

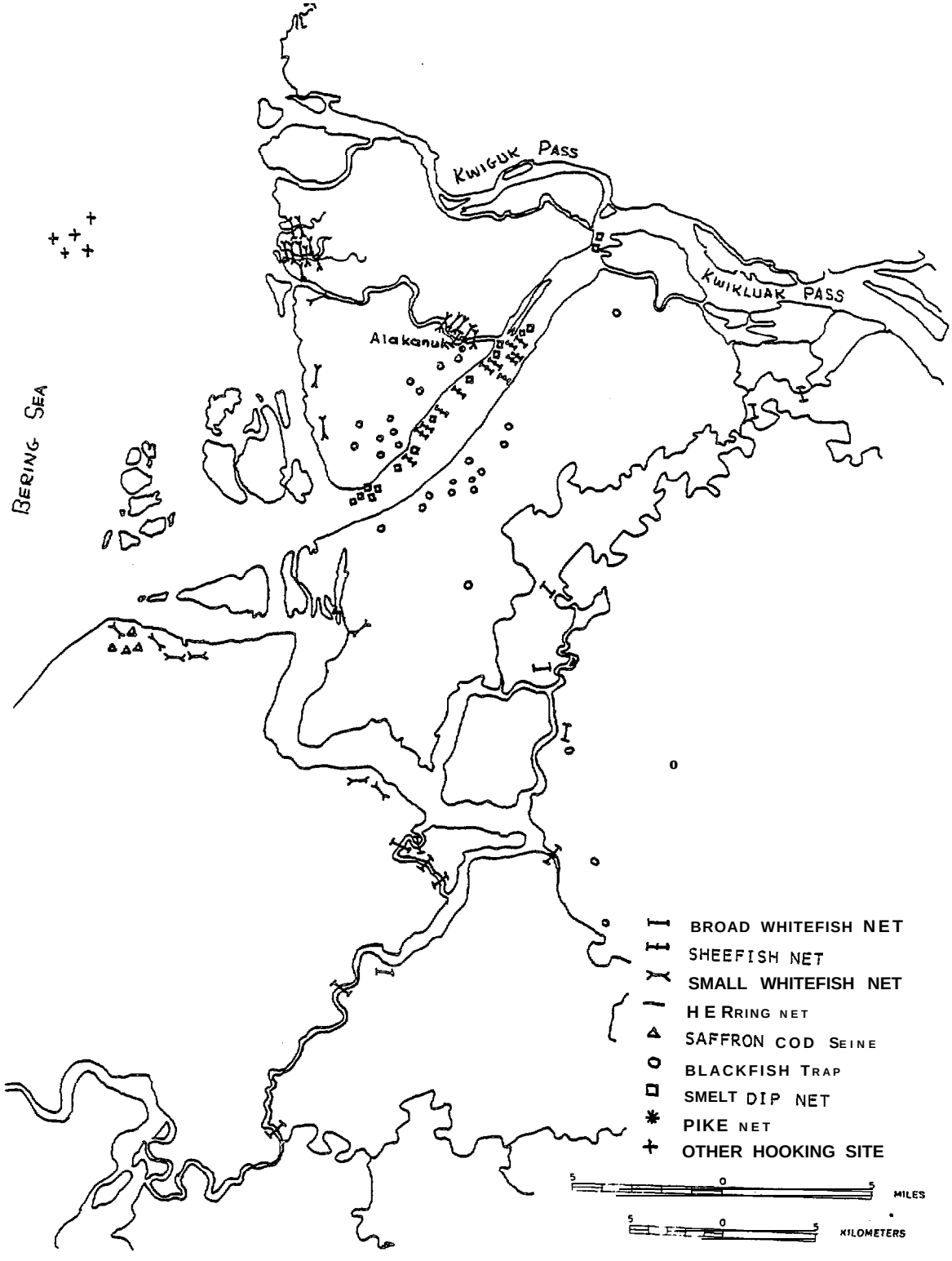


Figure 13. Fishing locations for non-salmon fish species, June 1980-May 1981, of a sample of households from Alakanuk (n=21)

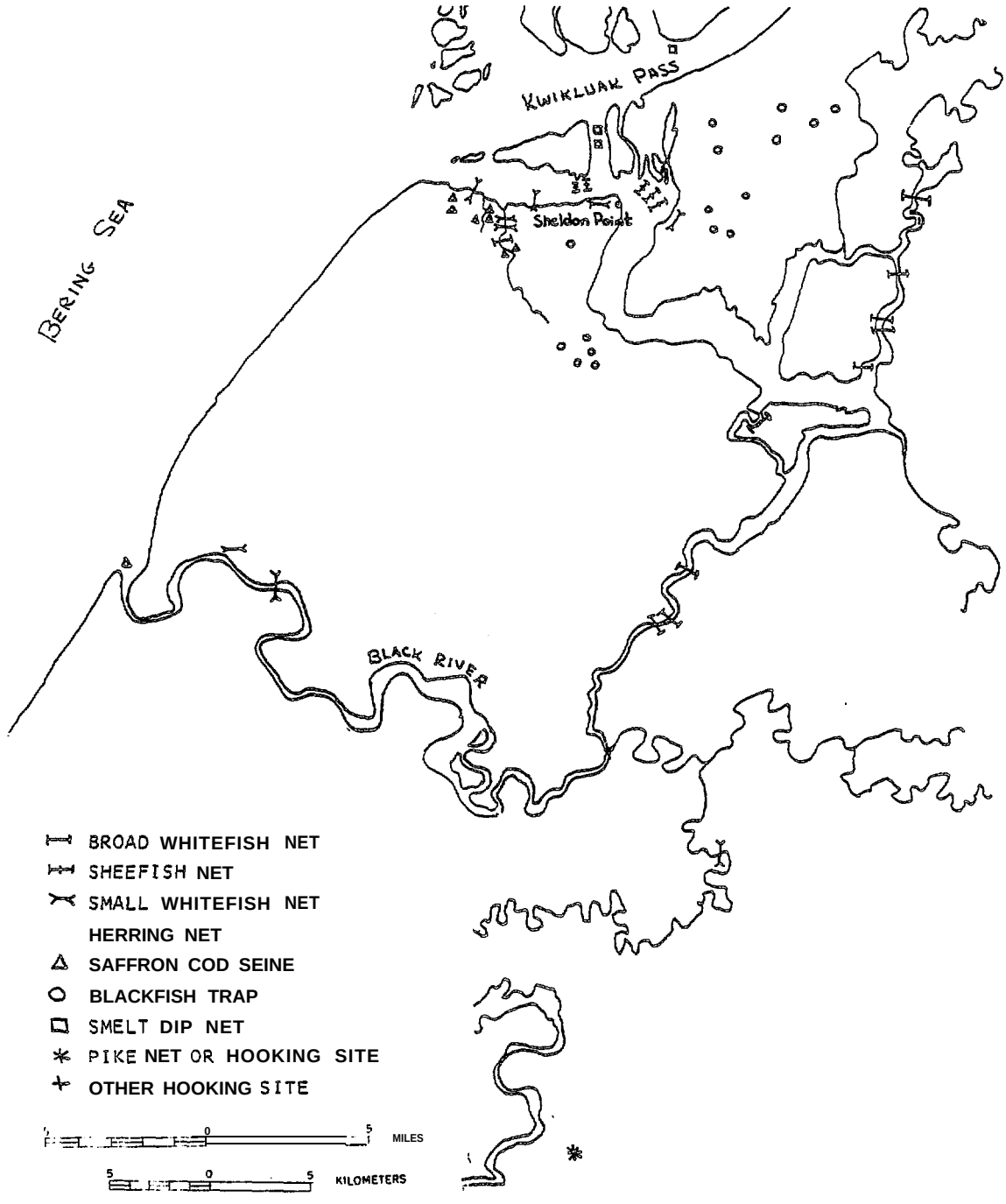


Figure 14. Fishing locations for non-salmon fish species, June 1980-May 1981, of a sample of households from Sheldon Point (n=7)

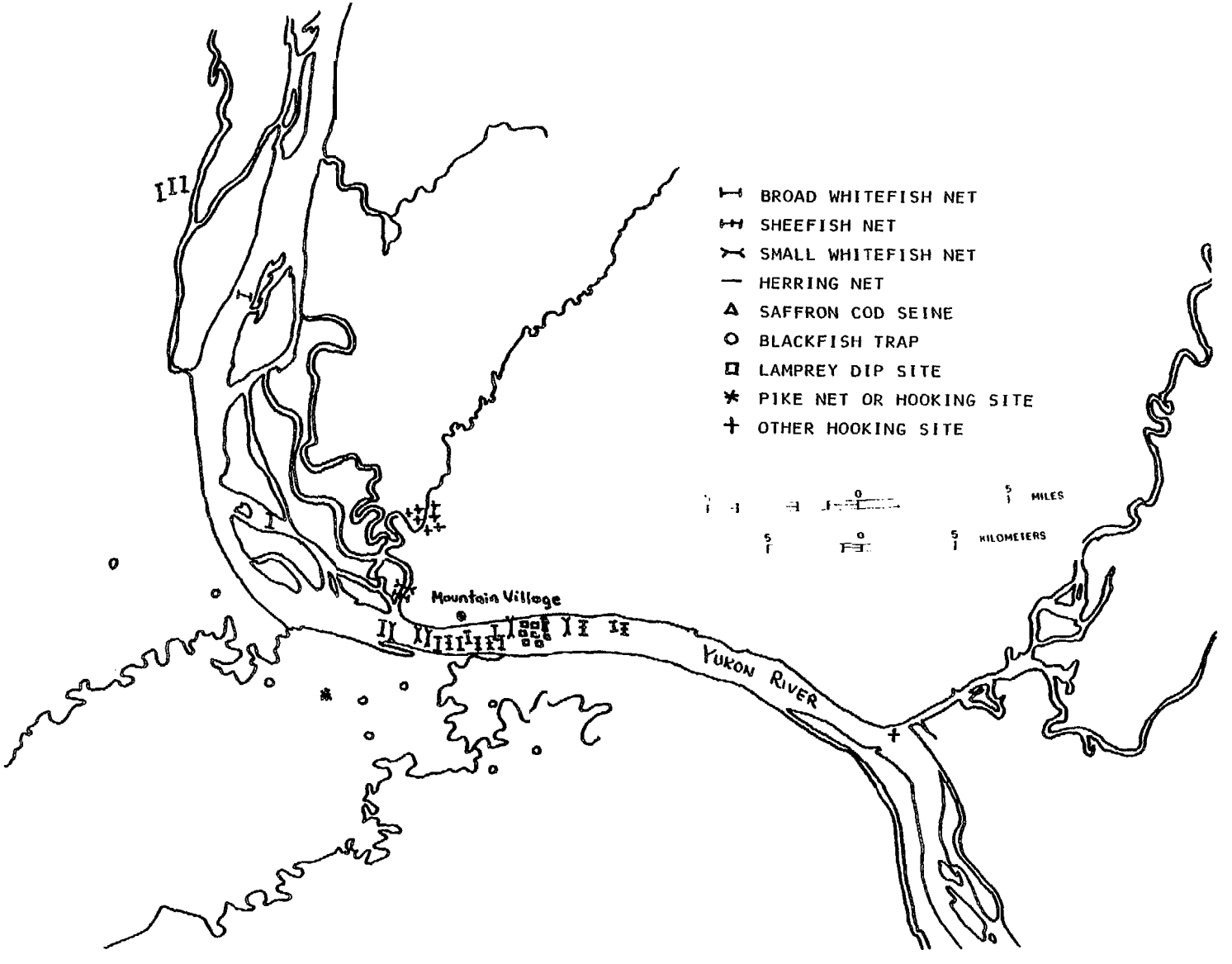


Figure 15. Fishing locations for non-salmon fish species, June 1980-May 1981, of a sample of households from Mountain Village (n=16)

Figure 16. Fishing locations for non-salmon fish species in the Kusilvak Mountains region, June 1980-May 1981, of a sample of households from Emmonak, Alakanuk, Sheldon Point, and Mountain Village (n=62)

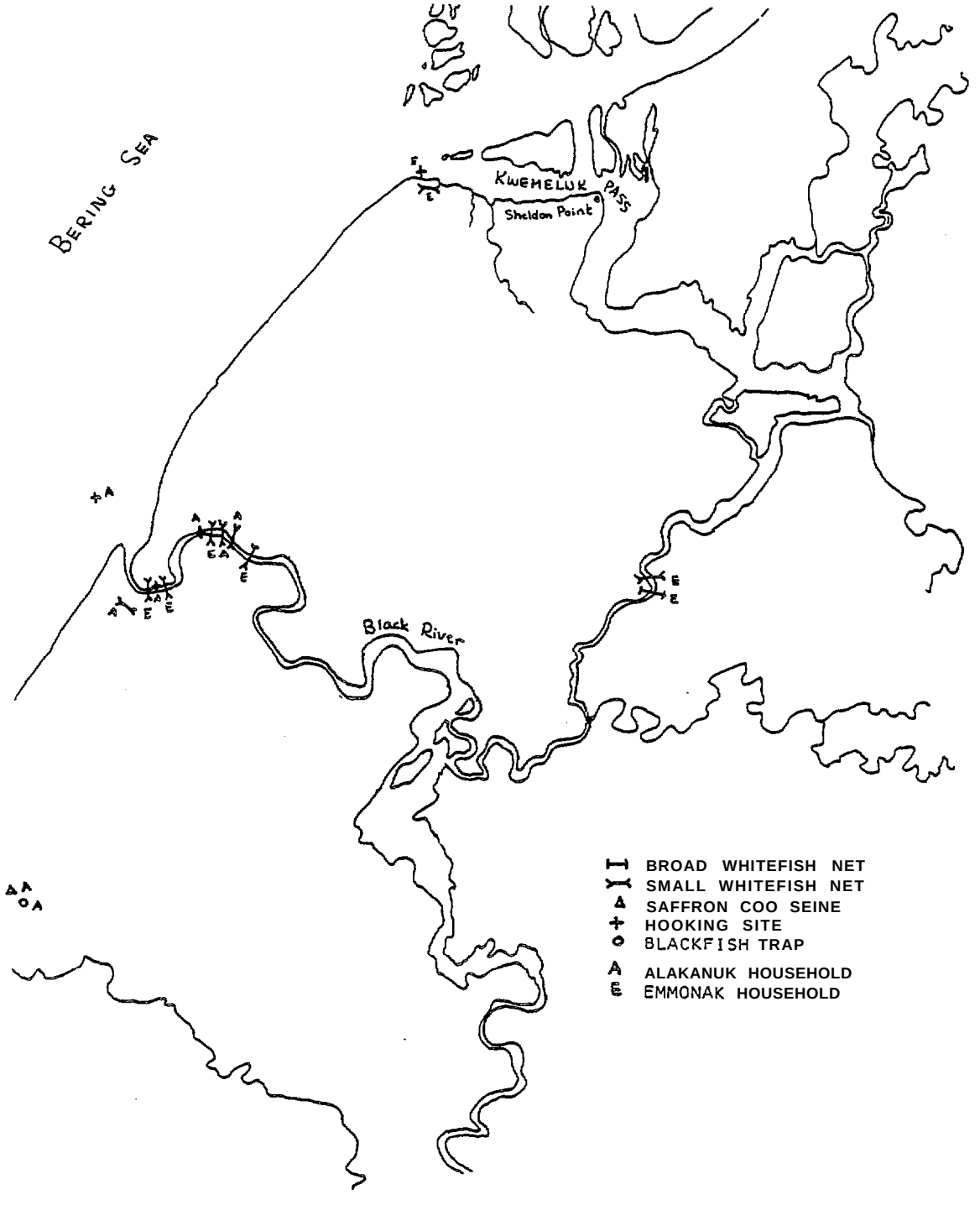


Figure 17. Fishing locations for non-salmon fish species, June 1980-May 1981, not depicted in Figures 10-16.

Waterfowl, Land Mammals, and Fur Bearers

The hunting areas for waterfowl land mammals, and fur bearers could not be depicted adequately on maps from the methodology utilized in this study. During 1980 to 1981, Kwikpagmiut and Tapraqmiut hunters typitally hunted these resources over large and variable areas within the region. Precise boundaries of these economic activities were not easily identifiable on topographic maps, so it was considered inappropriate to attempt to map them. In general, waterfowl land mammals, and fur bearers were hunted by Kwikpagmiut throughout the lowlying areas of the Yukon delta region. This encompassed an area bounded by the Black and Kasunok Rivers to the south, Paimiut Slough to the east, and the Andreafsky Mountains to the north. Hunting for land mammals at times brought Yukon River residents into the Andreafsky Mountains. Waterfowl, land mammals, and fur bearers were harvested by the Tapraqmiut of Stebbins on Stuart Island, the lowlying coastal tundra from Stebbins south to about Point Romanof, and the Andreafsky Mountains to the south, including the Gosolvia River drainage, east fork of the Andreafsky River, and the upper reaches of the Pikmiktalik.

Geographic Characteristics of Resource Utilization

Despite the limitations of the geographic data in terms of sample size and time depth, some tentative generalizations can be advanced concerning the geographic patterns of resource use in the Yukon delta area.

1. Collectively, the fishing and hunting activities of the six villages in the study area covered the entire Yukon delta region. From the areas utilized by the sample of households during June 1980 to May 1981, apparently most or all of the lands and waters of the Yukon delta region were utilized for the harvest of economic resources at one time or another during the year.

2* Several important economic resources within the region were harvested directly from or near to ocean waters. These resources included king, chum, and coho salmon; herring; bearded, ringed, and spotted seals; belukha whales; and saffron cod.

3. Other important economic resources were harvested from land areas or waterways within the coastal fringe of the Yukon delta. These resources included sheefish, Bering cisco, burbot, broad whitefish, blackfish, migratory waterfowl, sea birds, mink, muskrat, and land otter.

4. Seal hunting activities, especially during spring, were conducted frequently 30 miles out into the ocean. This suggests that conceptualizing the economic region as being bounded by the coastal shoreline is incorrect. The actively utilized economic region includes land-fast ice and lead areas extending out from the shoreline 30 to 40 miles.

5. Because of their geographic ranges, most major economic activities in the region were influenced directly by conditions within the region's oceanic, riverine, and coastal tundra environments. Changes occurring within these environments could be expected to have direct and immediate effects upon the major economic! activities of the region.

CHAPTER 4

SUBSISTENCE AND COMMERCIAL HARVESTS IN THE YUKON DELTA REGION, JUNE 1980 - MAY 1981

As described in Chapter 3, the Kwikpagmiut economy was a diversified and flexible pattern of fishing, hunting, and marketing activities. The Kwikpagmiut's primary food resources, king and chum salmon, locally supplemented with seal, belukha, waterfowl, whitefish, and other fish species, were harvested for both local consumption and market sale. The Tapraqmiut's economy in addition included the harvesting of herring, littoral sea products such as seabird eggs, clams, and roe on kelp, and walrus. In the contemporary economy, the hunting, fishing, and marketing sectors were interdependent: success in one sector facilitated success in the other for producing households.

This chapter provides quantitative data that illustrate the high dependence of the Kwikpagmiut on the fishing, hunting, and marketing of local resources from the land, rivers, and sea. The chapter presents harvests by a sample of households for local consumption and exchange and for export sale during a year's period, from June 1980 to May 1981. These data should complement the general descriptive information on the Kwikpagmiut economy within the previous chapter. Whereas Chapter 3 described the general seasonal round of economic activities, this

chapter estimates actual levels of economic output for a single year's time by a sample of households.

A cautionary note must be sounded before the quantitative information is presented. The seasonal round of economic activities within the Kwikpagmiut region was neither a certain nor invariable pattern. From one year to the next, the relative abundance of important migratory species such as salmon, seal, and whitefish cannot be predicted with any assurance. Nor can the vagaries of weather which may curtail or disrupt harvesting and storage activities be predicted, Consequently, the types and quantities of resources taken by a household typically vary yearly. When one resource fails, others have to be taken in larger quantities to make up deficiencies. A producer, by necessity, had to remain somewhat flexible and opportunistic in his economic pursuits.

The period June 1980 to May 1981 was an atypical year for the Yukon delta study area in one central respect. The locations and strengths of the 1980 salmon runs were unusual. As is discussed later in this chapter, abnormally large Puns of salmon entered the Yukon River through the middle and north passes, while correspondingly smaller runs entered through the south passes. Consequently for certain communities like Kotlik and Mountain Village, salmon harvests reportedly were unusually high, while at other communities like Alakanuk and Emmonak, salmon harvests reportedly were poor. The relative success of' commercial and subsistence salmon fishing during summer undoubtedly influences a house. hold's subsistence fishing and hunting choices the remainder of the

year. Because of the unusual salmon harvests for certain families during the summer of 1980, one might expect uncommon patterns of utilization for certain other resources. There currently does not exist enough data to depict how harvest levels of salmon influence harvest levels of other kinds of resources, or of other economic decisions of producers in the Yukon delta region. A variety of theoretical hypotheses can be advanced, but assertions about causal interactions would be mere speculation until more complete data have been collected on the economic systems in the region.

Thus, the harvest figures for the sampled households during June 1980 to May 1981 should not be taken to represent a fixed index or measure of food and monetary output for the Kwikpagmiut region. The quantities of food harvested may be typical of food harvests some years, but not typical for harvests other years. Only longitudinal information can demonstrate the degree of variation in production output from year to year in the region. The substantial degree of variation between communities on the delta for the study year provides ample support for assuming a cautionary stance in interpreting economic data representing only a single year's activity.

Methodology

The goal of this portion of the study was to generate some systematic information concerning subsistence harvests by households from each of the six study communities. Some quantitative estimate of the amounts of

food produced by families within the region was a desired end. Given the time restraints of the study, a retrospective design based upon verbal reports of household heads was chosen as a feasible data gathering approach. A sample of households was selected for systematic, in-depth questioning concerning food output during the past. year. The sample was selected in this manner. A complete list of households within each community was developed from one or several residents who were knowledgeable about their community and its fishing, hunting, and marketing economy. The local experts were directed to indicate which households they felt should be spoken with concerning fishing and hunting in this community. The reason presented was for gathering accurate and complete information on fishing and hunting in the area.

The researcher attempted to contact and speak with each of the households indicated. From all appearances, some of the households represented persons currently involved in fishing and hunting to a significant degree, while others represented persons considered knowledgeable about fishing and hunting, although perhaps not currently involved in it, such as elderly men and women. In addition to contacting these households other households were consulted selected to represent as broad an age and income range as possible within the community. This latter group comprised a sample of convenience. Using this selection approach, the researcher set a 20 percent sample of households within each community as a projected goal.

Table 4 shows the number and percent of households identified and contacted within each community. As can be seen, out of about 425 identified households, 88 received in-depth questioning about fishing and hunting the past year representing a 20.7 percent sample. Community samples ranged from as low as 16.7 percent at Mountain Village, to a high of 30.4 percent at Sheldon Point. Table 5 depicts the means and standard deviations for household size and age of household head for the sampled households. Mean ages tended to be in the mid to late 40's; mean household sizes were about six persons per household.

As was discussed in Chapter 1, the non-random selection of the sample of households cautions against generalizing harvest and income data to typify all other households in the Yukon delta area, or generalizing data to represent an estimate of total harvests in the region. The selection technique probably injected certain biases into the sample composition and distortions in the harvest data. First, the average age of sampled households heads is probably higher than the average age of household heads for the region. Production outputs of particular food species are affected by age, as is discussed in this chapter, so the relatively older sample of households heads will influence the average output levels for particular species. Second, relatively successful households in the economic system are probably overrepresented in the sample. Successful households are those which produce comparatively higher subsistence and monetary incomes than others in the community through a combination of factors such as skill, hard work, job opportunities, good health, and good fortune. By being overrepresented in

Table 4

SAMPLE OF HOUSEHOLDS INTERVIEWED FROM COMMUNITIES

OF THE YUKON DELTA REGION

Community	1980 Population		Estimated Number of Households		
	Native	Total	Identified	Interviewed	Percent Interviewed
Alakanuk	491	522	90	21	23.3
Emmonak	517	567	100	18	18.0
Kotlik	280	293	56	14	25.0
Mountain Village	539	583	96	16	16.7
Sheldon Point	98	103	23	7	30.4
Stebbins	316	331	60	12	20.0
Combined Communities	2,241	2,399	425	88	20.7

Table 5

CHARACTERISTICS OF SAMPLED HOUSEHOLDS

Community	Household Size		Age of Household Head	
	Mean	Standard Deviation	Mean	Standard Deviation
Alakanuk	6.6	2.4	47.7	12.9
Emmonak	4.5	2.7	49.3	14.4
Kotlik	6.7	3.0	42.1	9.7
Mountain Village	5.4	3.4	50.6	16.2
Sheldon Point	6.0	3.7	46.6	12.8
Stebbins	6.3	2.4	45.9	15.5
Combined Communities	5.9	2.9	47.3	13.7

the sample, this may distort the average output levels of' certain resources. The extent of these distortions may not be clearly understood. until a more complete sample of less successful households is systematically surveyed. However, one distortion probably is an over-estimate in the average household income from wage employment, as is discussed further in the chapter. The sampled households probably contained a disproportionately larger number of wage earning members in comparison with other households in the community. Because of' this bias, ranges and standard deviations are provided for the monetary income data. These potential biases and distortions must be recognized when interpreting the data (refer to Chapter 1 discussion).

Household Harvests of Fish and Game Resources, June 1980 - May 1981

The mean household harvests of fish and game resources of 88 sampled households from June 1980 tc May 1981 are presented in Table 6. Household harvests are expressed as pounds dressed weight, representing pounds of edible food product. Mean harvests are summarized by community. The percentage of households harvesting particular fish and game resources are presented in Table 7.

Table 6 illustrates that households were highly dependent upon local food resources harvested from the land and sea during 1980-1981. Average food output per household for local consumption and exchange purposes were as follows: Alakanuk, 4,821 pounds; Emmonak, 2,759

Table 6

MEAN HOUSEHOLD HARVESTS OF SELECTED FISH AND GAME RESOURCES, JUNE 1980-MAY 1981*

Fish	Alakanuk	Emmonak	Kotlik	Mountain Village	Sheldon Point	Stebbins
Subsistence king salmon	480	359	301	385	1,543	1,276
Subsistence chum and coho salmon	824	659	667	982	3,159	1,190
Commercial king salmon	1,894	2,885	9,152	4,376	1,701	0
Commercial chum and coho salmon	5,350	4,899	13,485	11,381	7,972	0
Subsistence herring	0	0	0	0	0	1,113
Commercial herring	0	0	0	0	0	2,196
Bering cisco	164	147	171	38	103	63
Broad whitefish	122	66	145	834	48	9
Sheefish	353	321	460	395	943	19
Blackfish	998	215	142	347	1,386	0
Saffron cod	68	36	41	0	181	247
Smelt	23	0	30	0	6	0
Pike	67	82	7	367	24o	0
Burbot	56	47	19	88	20	0

Table 6-CONTINUED

Fish	Alakanuk	Emmonak	Kotlik	Mountain Village	Sheldon Point	Stebbins
Other fish	0	0	0	63	4	1
TOTAL SUBSISTENCE FISH	3,155	1,932	1,983	3,498	7,633	3,918
TOTAL COMMERCIAL FISH	7,244	7,784	22,637	15,757	9,673	2,196
TOTAL FISH RESOURCES	10,399	9,716	24,620	19,255	17,306	6,114
Sea Mammals						
Bearded seal	280	54	339	70	490	420
Spotted seal	107	53	79	46	289	56
Ringed seal	188	85	134	7	335	292
Belukha	233	233	150	0	350	700
Walrus	33	0	0	0	0	560
Sea lion	13	0	0	0	0	0
TOTAL SEA MAMMALS	854	425	702	123	1,464	2,028
Land Mammals						
Moose	273	179	204	402	238	60
Caribou	0	0	29	0	67	0
Otter	4	0.3	5	4	10	0
Mink	17	2	30	4	27	0
Hares	108	51	108	82	46	45

Table 6-CONTINUED

Land Mammals	Alakanuk	Emmonak	Kotlik	Mountain Village	Sheldon Point	Stebbins
Beaver	28	6	27	26	20	0
Muskrat	35	19	74	170	37	4
Bear	0	0	0	13	0	0
TOTAL LAND MAMMALS	465	257	477	701	445	109
Birds						
Geese	145	67	144	30	111	152
Ducks	42	35	33	18	40	74
Cranes	38	11	37	7	32	70
Swans	72	21	26	14	30	13
Ptarmigan	51	11	27	28	29	11
TOTAL BIRDS	347	145	267	97	242	320
TOTAL SUBSISTENCE FOOD HARVEST	4,821	2,759	3,429	4,419	9,784	6,375
TOTAL COMMERCIAL FISH HARVEST	7,244	7,784	22,637	15,757	9,673	2,196
TOTAL SUBSISTENCE AND COMMERCIAL HARVESTS	12,065	10,543	26,066	20,176	19,457	8,571

*Of 88 sampled households, by community: harvests expressed as pounds dressed weight, representing pounds of edible food product.

Table 7

PERCENTAGE OF SAMPLED HOUSEHOLDS HARVESTING SELECTED SPECIES,

JUNE 1980-MAY 1981

	Alakanuk	mmo	Kotlik	Mountain Village	Sheldon Point	Stebbins
(subsistence)	100.0	72.2	85.7	93.8	100.0	75.0
Salmon (commercial)	71.4	83.3	100.0	87.5	100.0	0
Herring (subsistence)	0	0	0	0	0	83.3
Herring (commercial)	⊙	⊙	0	⊙	0	33.3
Bering cisco	85.7	83.3	100.0	31.3	66.7	75.0
Broad whitefish	53.4	44.4	50.0	81.3	66.7	8.3
Sheefish	61.9	61.1	78.6	68.8	83.3	33.3
Blackfish	71.4	55.5	42.9	62.5	83.3	0
Saffron cod	42.9	27.8	42.9	0	66.7	91.7
Smelt	42.9	0	14.3	0	33.3	0
Pike	42.9	55.6	35.7	93.8	83.3	0
Burbot	52.4	27.8	50.0	68.8	50.0	0
Lamprey	0	0	0	69.2	0	0
Seal	71.4	50.0	100.0	56.3	100.0	100.0

Table 7-CONTINUED

	Akanuk	Emmo	Kotlik	Mountain Village	Sheldon Point	Stebbins
Belukha	23.8	22.2	14.3	0	33.3	41.7
Walrus	5.8	0	0	0	0	41.7
Sea lion	9.5	0	0	0	0	0
Moose	28.6	16.[illegible]	21.4	50.0	33.3	8.3
Caribou	0	0	7.1	0	16.7	0
Otter	33.3	11.1	28.6	25.0	33.3	0
Mink	66.7	22.2	35.7	37.[illegible]	50.0	0
Hares	85.7	77.8	92.9	75.0	100.0	50.0
Beaver	28.6	22.2	28.6	37.5	16.7	0
Muskrat	71.4	61.1	71.4	68.8	100.0	41.7
Geese	85.7	88.9	92.9	87.5	83.3	91.7
Ducks	85.7	[illegible].9	85.7	81.3	100.0	83.3
Cranes	71.4	44.4	85.7	31.3	66.7	83.3
Swans	66.7	27.8	50.0	37.5	83.3	33.3
Ptarmigan	81.0	55.6	92.9	81.3	83.3	58.3
Wage employment	57.0	83.3	8[illegible].7	62.5	100.0	75.0
Food stamps	47.6	16.7	7.1	43.8	66.7	50.0
Other income assistance	47.6	27.[illegible]	35.7	62.5	16.7	41.7

pounds; Kotlik, 3,429 pounds; Mountain Village, 4,419 pounds; Sheldon Point, 9,784 pounds; and Stebbins, 6,375 pounds. That is, at Alakanuk, the sampled households produced an average of 4,821 pounds of edible food during the period June 1980 to May 1981. As household sizes varied among families and villages, the following figures represent average food output per person: Alakanuk, 733 pounds; Emmonak, 612 pounds; Kotlik, 510 pounds; Mountain Village, 822 pounds; Sheldon Point, 1,397 pounds; and Stebbins, 1,006 pounds. That is, at Alakanuk, the sampled households produced 733 pounds of edible food for each household member during the period June 1980 to May 1981 (see Table 8).

Collectively, for the six study villages in the Yukon delta region, average food output per household for local consumption and exchange purposes was 4,597 pounds dressed weight during June 1980 to May 1981. Average food output per household member was 783 pounds dressed weight.

In addition to harvests for local use, the sampled households sold substantial quantities of salmon and herring on export markets. The average harvest of commercial salmon per household during the summer of 1980 was Alakanuk, 7,244 pounds; Emmonak, 7,784 pounds; Kotlik, 22,637 pounds; Mountain Village, 15,75'7 pounds; and Sheldon Point, 9,673 pounds. Collectively, this averaged 10,447 pounds of salmon per household for the five villages, sold at an average market value of $7',966. The average harvest of commercial herring sale of the sampled Stebbins household in 1980 was 2,196 pounds, sold at $439 on export markets.

Table 8

MEAN HOUSEHOLD SUBSISTENCE HARVESTS BY COMMUNITY*

		Alakanuk	Emmonak	Kotlik	Mountain Village	Sheldon Point	Stebbins
Subsistence Output per Household	Mean	4,821	2,754	3,429	4,419	9,784	6,375
	Range	371-14,343	477-5,982	604-8,616	336-10,525	3,838-26,090	1,296-14,334
	Standard Deviation	3,612	1,620	2,213	2,984	8,222	3,935
Subsistence Output per Household Member	Mean	733	612	510	822	1,397	1,006
	Range	92-1,495	148-2,614	76-2,154	112-4,682	707-3,266	259-3,082

*Of 88 sampled households during the period June 1980-May 1981; harvest expressed as pounds dressed weight, representing pounds of edible food product.

These commercial fish harvests represented about 4.5 percent of a household% total earned monetary income.

Mean monetary incomes per sampled household for the period June 1980 to May 1981 are presented as Table 9 and Table 10. As can be seen, of the total monetary income, 90.5 percent was earned, whereas 9.5 percent came from food stamps and other forms of income assistance. Of the earned monetary income, 41.5 percent was from commercial fishing, 5.7 percent from commercial sale of furs, 40.7 percent from wage employment, and 2.6 percent from retirement and Social Security benefits.

There was substantial variation in monetary income levels between households and between communities. As is shown in Tables 9 and 10, there were extreme ranges in monetary incomes. For instance, at Alakanuk mean monetary income from commercial fishing was $5,269, yet income ranged from $0 to $16,065 with a standard deviation of $5,092, showing great dispersion about the mean. Thus, mean incomes should only be interpreted in conjunction with sample ranges and standard deviations. Mean incomes should not be taken to represent incomes from a 'typical" household. This would lead to spurious conclusions, such as that a 'typical" household received $1,087 in income assistance and $746 in food stamps while earning $17,512 in commercial sales of fish and furs, wage employment, and retirement (Table 10). Actually, only a certain number of households received income assistance and food stamps and this income has been averaged across all households. In a like manner, the relatively higher monetary income levels of a few households tend to raise

Table 9

MONETARY INCOMES PER HOUSEHOLD BY COMMUNITY AND SOURCE*

community		Commercial fish	Commercial furs	Wage Employment	Retirement	Food Stamps	Other Welfare	Total Income
Alakanuk	Mean	$5,269	$1,180	$5,718	$307	$1,277	$1,149	$14,900
(n=21)	Range	0–				0–		$5,350-
		$16,06 5	$4,00:-	$23,13;	$3,58;	$5,124	$6,86;	$33,071
	S.D.	$5,092	$1,386	$7,508	$976	$1,809	$1,920	$8,128
Emmonak	Mean	$5,521	$580	$11,999	$255	$232	$981	$19,496
(n=18)	Range	0–			0	0–		$1,434-
		$34,320	$2,68!	$36,60;	$3,000	$2,438	$6,27;	$52,166
	S.D.	$7,852	$865	$10,970	$779	$625	$1,842	$13,102
Kotlik	Mean	$19,716	$2,219	$7,587	$231	$56	$892	$30,701
(n=14)	Range	$1,600-		0–		0–		$10,600-
		$37,198	$9,30:-	$20,171	$3, 24;	$780	$8,66;	$50,256
	S.D.	$11,196	$2,712	$6,401	$866	$208	$2,283	$12,482
Mt. Village	Mean	$11,103	$1,156	$5,154	$613	$622	$1,159	$19,807
(n=16)	Range	0		0		0–	0–	$5,000-
		$25,950	$8,52:	$29, 505	$4,30:-	$4,520	$8,664	$50,760
	S.D.	$7,959	$2,117	$7,777	$1,278	$1,165	$2,216	$13,568
Sheldon Pt.	Mean	$6,216	$1,719	$12,970	0	$1,842	$1,150	$23,897
(n=7)	Range	$2,670-		$6,702-	0		0	$11,972-
		$11,023	$6,48;	$18,750		$5,50:	$6,900	$34,638
	S.D.	$3,311	$2,479	$5,613	0	$2,274	$2,817	$8,985
Stebbins	Mean	$439	$261	$7,555	$1,710	$1,071	$1,329	$12,365
(n=12)	Range		0		0	0		$2,623-
		$2,00:	$2,180	$16,15;	$11, 220	$5,352	$8, 64;	$26,190
	S.D.	$732	$623	$7,478′	$3,356	$1,630	$2,503	$7,850

*Of 88 sampled households, for the period June 1980-May 1981.

Table 10

MEAN MONETARY INCOME PER HOUSEHOLD BY SOURCE

FOR SIX YUKON DELTA COMMUNITIES COMBINED*

	Commercial Fish	Commercial furs	Wage Employment	Retirement	Total Earned Income	Food Stamps	Other Welfare	Total Income
Mean Income per Household	$8,026	$1,101	$7,878	$507	$17,512	$746	$1,087	$19,345
Range	0-$37,198	0-$9,308	0-$36,600	0-$11,220	0-$52,166	0-$5,500	0-$8,664	$2,623-$52,166
Standard Deviation	$9,172	1,810	$8,393	$1,551	$12.673	$1,41	$2,101	$12,418
Percent of Total Earned Income	45.8	6.3	45.0	2.9	100.0	--	--	--
Percent of Total Income	41.5	5.7	40.7	2.6	90.6	3.9	5.6	100.0

*Of 88 sampled households from Alakanuk, Emmonak, Kotlik, Mountain Village, Sheldon Point, and Stebbins, for the period June 1980-May 1981.

the mean incomes of the sample as a whole. The wide variability within income levels and sources of income points out that it would be conceptually difficult to depict a 'typical" household on the Yukon delta which allegedly represented some majority of households.

It must be noted that the salmon earnings of the sampled households at Kotlik is abnormally high for this community, or for any community on the Yukon delta. The 1980 salmon season was atypical, as is discussed later in this chapter, so the 1980-1981 monetary income of the Kotlik sample clearly presents a distorted picture of most years. Dividing the income of $19,716 by a factor of three would more closely approximate usual average salmon earnings for this community.

Placing a monetary value to food harvests for personal use poses thorny theoretical problems. As the products do not legally circulate on local markets, their market values are not determinable. Using the values of these products elsewhere also is unsatisfactory. However, one assumption can be made that if the food products were not harvested by the family, then food 'substitutes" would have to be purchased from local stores at local market prices. A second assumption can be made that imported canned and frozen meat, fish, and poultry were the nearest 'substitutes" to the meat, fish, oil, and waterfowl obtained locally. (Most local residents insisted that meats like beef and ham were <u>not</u> equivalent to products like seal meat and Canada goose.)

Imported canned and frozen meat, fish, and poultry sold at the Alaska Commercial Company store at Emmonak for about $4.62 per pound (see 'I'able 11). This comprises an average of 17 items. The two most and least expensive items were not included in the mean--beef stew at $1.70, corned beef hash, $1.97, T-bone steaks, $9.65, and New York steaks, $11.89. These prices are for products which, at times, included bone weights.

If these assumptions are accepted, then the 4,597 pounds dressed weight of food resources taken locally would cost a household $21,238 if the household had to purchase 'substitutes" at a local store. This is more than the mean annual earned monetary income per household in the Yukon delta region, which was estimated at $17,512 for the sampled households.

It is clear from these figures that most households subsisted on food and monetary income from several sources. A household typically sought to diversify its production efforts to achieve some combination of' fishing and hunting for local consumption and distribution fishing and trapping for commercial sale, and wage employment. A household rarely if' ever subsisted on food or monetary income from one source only. The income which usually could be made from one sector of the economy, such as wage employment or fishing for local consumption, usually was insufficient to support a household. A failure of income from any sector of the economy typically created substantial hardships for a family, as will be seen in the following community comparisons.

Table 11

MEAT. , FISH, AND POULTRY PRICES,
ALASKA COMMERCIAL COMPANY STORE ,
EMMONAK, JUNE 16, 1981

	Price Per Pound
Beef Stew	$1.70
Corned Beef Hash	$1.97
Meat Balls	$2.23
Chicken Legs and Thighs	$2.91
Vienna Sausage	$3.04
Light Tuna	$3.82
Spare	$3.95
Sliced Bacon	$4.09
Beef Hearts	.$4.15
Pork Spare Ribs	$4.69
Bologna	$4.70
Beef Tongue	$5.09
Salami	$5.30
Chuck Roast	$5.55
Stew Beef	$5.65
Pork Chops	$5.75
Sardines	$6.36
Beef Top Round	$6.55
T-Bone Steak	$9.65
New York Steak	$11.89
Mean price per pound, excluding two least and most expensive items	$4.62

Community Comparisons

The harvest levels summarized above demonstrate the regional populations' high degree of reliance on fishing and hunting for local use and commercial sale. The figures also illustrate differences between communities during the study year in fishing and hunting outputs, both in terms of total harvests, and the relative size of harvests for particular species. As stressed in Chapter 3, the economic patterns for each community within the Yukon delta area were somewhat unique. A food resource might play an important role in the local economy of d yet occupy a relatively less important position in the economy of another village. Such differences make it difficult to generalize about the economy of the region as a whole, or to generalize about the effects of potential changes in the resource base or general economic climate on a community's economic situation. The following discussion points out some of the differences in harvest outputs between communities evident within the quantitative estimates of food production.

Ecological Adaptations

In general, harvest levels of particular food products reflected a community% geographic location. This is illustrated by Table 12, which depicts mean harvests within general resource categories per household by community. Communities along the seacoast with greater access to the sea harvested larger numbers of sea mammals than the one inland community of Mountain Village. Stebbins, the coastal Norton

Table 12

ECOLOGICAL ADAPTATIONS OF THE ESKIMOS OF THE YUKON DELTA REGION*

	Inland Yukon River Salmon Fishing Adaptation	Coastal Yukon River Salmon Fishing and Small Sea Mammal Hunting Adaptation				Coastal Norton Sound Herring Fishing, Salmon Fishing, Small Mammal Hunting Adaptation
	Mountain Village	Alakanuk	Emmonak	Kotlik	Sheldon Point	Stebbins
Salmon	17,124 (84.9)	8,548 (70.8)	8,802 (83.5)	23,605 (90,6)	14,375 (73.9)	2,466 (28.8)
Herring	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3,309 (38.6)
Other fish	2,131 (10.6)	1,851 (15.3)	914 (8.7)	1,015 (3.9)	2,931 (15.1)	339 (4.0)
Sea mammals	123 (0.6)	854 (7.1)	425 (4.0)	702 (2.7)	1,464 (7.5)	2,028 (23.7)
Land mammals	701 (3.5)	465 (3.9)	257 (2.4)	477 (1.8)	445 (2.3)	109 (1.3)
Birds	97 (0.5)	347 (2.9)	145 (1.4)	267 (1.0)	242 (1.2)	320 (3.7)
Total	20,176 (100.0)	12,065 (100.0)	10,543 (100.0)	26,066 (100.0)	19,457 (100.0)	8,571 (100.0)

Sound community, harvested the most, 2,028 pounds of sea mammals per household, representing 23.7 percent of their total output. The coastal Yukon River communities (Alakanuk, Emmonak, Kotlik, Sheldon Point) harvested between 425 and 1,465 pounds of sea mammals per household, representing between 2.7 and 7.5 percent of their total output. Mountain Village, an inland Yukon River community with less access to the sea, harvested 123 pounds of sea mammals per household, or 0.6 percent of their output. This is not to suggest that sea mammals were unimportant to Mountain Village residents. Indeed, Table 7 shows that 56.3 percent of the sampled households at Mountain Village had some member who hunted sea mammals. The other households received seal oil and meat as gifts or trade items from relatives and friends along the coast, as is discussed in Chapter 7. Seal oil was considered an essential food product by most surveyed households at Mountain Village.

Conversely, harvests of land mammals were highest at the inland community of Mountain Village, where they totalled 701 pounds per household, 3.5 percent of their total output. Coastal Yukon River communities were intermediary? harvesting between 257 and 477 pounds of land mammals (1.8 to 3.9 percent of their total output), while Stebbins had the lowest output with 109 pounds (1.3 percent).

Salmon was the principal resource harvested by Yukon River communities from 8,548 to 23,605 pounds per household representing 70.8 to 90.6 percent of their output. These figures represent total salmon output for local use and market sale. Stebbins' salmon output was less at

2,466 pounds per household, or 28.8 percent of their output. By contrast, Stebbins harvested herring as another principal resource--3,309 pounds per household or 38.6 percent of their output.

An unheralded, but significant component of the economic output of Yukon River communities was non-salmon fish species, including Bering cisco, sheefish, broad whitefish, blackfish, and saffron cod. All five Yukon River villages harvested between one and three thousand pounds dressed weight per household of non-salmon fish. Currently, none of these fish were sold on commercial markets by the sampled households (a small market for broad whitefish and sheefish was developing in Anchorage, but in 1981 was providing small incomes for only a few fishermen on the main Yukon River). Consequently, these non-salmon fish catches comprised a substantial portion of a household's food supply .

All six communities harvested moderate quantities of waterfowl, varying from about 100 to 350 pounds per household and comprising from about 0.5 to 3.7 percent of family's total output. Although comparatively small within the total output, the waterfowl were a highly valued component of a family% yearly food supply. As shown in Table 7, over 80 percent of the sampled households attempted to procure some quantity of waterfowl for the year.

From these statistics, the economy of the Kwikpagmiut near the Yukon delta can be classified as a "Yukon River Salmon Fishing and Small Sea

Mammal Hunting Adaptation." This means that the central base of the regional economy was the harvesting of salmon (primarily king, chum, and coho), and small sea mammals (primarily ringed, bearded, and spotted seals, and belukha). The economies of the communities of Alakanuk, Kotlik, Emmonak, and Sheldon Point represented coastal variants of this general ecologic adaptation? whereas the economy of Mountain Village, represented an inland variant.

The economy of the Tapraqmiut at Stebbins can be classified as a "Coastal Norton Sound Herring Fishing, Salmon Fishing, and Small Sea Mammal Hunting Adaptation." This means that herring was an essential part of their local economy in addition to salmon resources and small sea mammal resources. Also, sea mammal harvests played a comparatively larger role in the community's economy than within the economies of the riverine Eskimos.

These designations do not imply that other food resources were less important. In fact, non-salmon fish species, migratory waterfowl, land mammals, and wage employment represented substantial and, to the Kwikpagmiut and Tapraqmiut, essential components of a household's yearly income. Salmon, sea mammals, and herring were central to the regional economy in that the extent and nature of other economic pursuits frequently pivoted on the relative success of the salmon, sea mammal, and herring harvests.

Economic Insecurity

Comparisons of community resource harvests for a single year graphically portray the economic insecurities inherent within a mixed economy of fishing, hunting, and marketing activities. The residents of the south pass communities of Alakanuk and Emmonak considered 1980 to have been a poor year in terms of salmon production whereas residents of Kotlik and Mountain Village considered 1980 to have been excellent. Alakanuk's and Emmonak's outputs of 8,548 and 8,802 pounds of salmon per household were one-half of Mountain Village% output and almost one-third of Kotlik's output for the same year. In general, salmon fishermen along the south pass reported that after expenses they made little monetary income from commercial salmon sales in 1980; many reportedly went into debt for the season. Commercial salmon sales at Alakanuk and Emmonak were $5,269 and $5,521, compared with Kotlik's $19,716 and Mountain Village's $11,103 per household.

Environmental factors played a primary role in the poor year along the south pass and good year along the north pass. For the last few years, and for some as yet unaccountable reasons, large numbers of salmon have entered the Yukon River through the middle and north passes. Correspondingly smaller salmon runs have entered through the south passes. Consequently, south pass fishermen have experienced significant reductions in salmon output in recent seasons; north pass fishermen have experienced an unexpected prosperity.

These fluctuations in salmon output are illustrated by Figure 18 and 19, which portray commerical king and chum salmon catches at the three mouths of' the Yukon delta--south mouth, middle mouth, and north mouth--based on commercial fisheries harvest sales tickets (data from ADFG Annual Management Report, Yukon Area, 1980. Appendix Tables 5, 7, and 12). South mouth harvests were made primarily by fishermen from Alakanuk and Sheldon Point, whereas harvests at middle mouth and north mouth were made primarily by fishermen from Kotlik and Stebbins (with a few fishermen from Emmonak). Figures 18 and 19 demonstrate substantial fluctuations from year to year in catches in these subdistricts, primarily due to variations in run strength and timing of runs and open periods, and not due to variations in harvest effort by fishermen. For instance, certain years, such as 1969, all three passes yielded above average king catches. Other years, such as 1973, south mouth fishermen made king catches markedly above average while middle and north mouth fishermen made catches markedly below average. The overall pattern during the past 15 years of harvest statistics is that average catches at south mouth have greatly exceeded average catches at middle and north mouths. Compared with this overall pattern, 1980 was an abnormal year. Middle and south mouth king and chum catches were at or near all-time highs, while south mouth catches were near the lowest points of the past 15 years.

The unusually high middle and north pass harvest can be illustrated further by comparing harvests by Kotlik fishermen during 197% and 1980. Eight fishermen surveyed at Kotlik in 1976 sold a total of 44,940

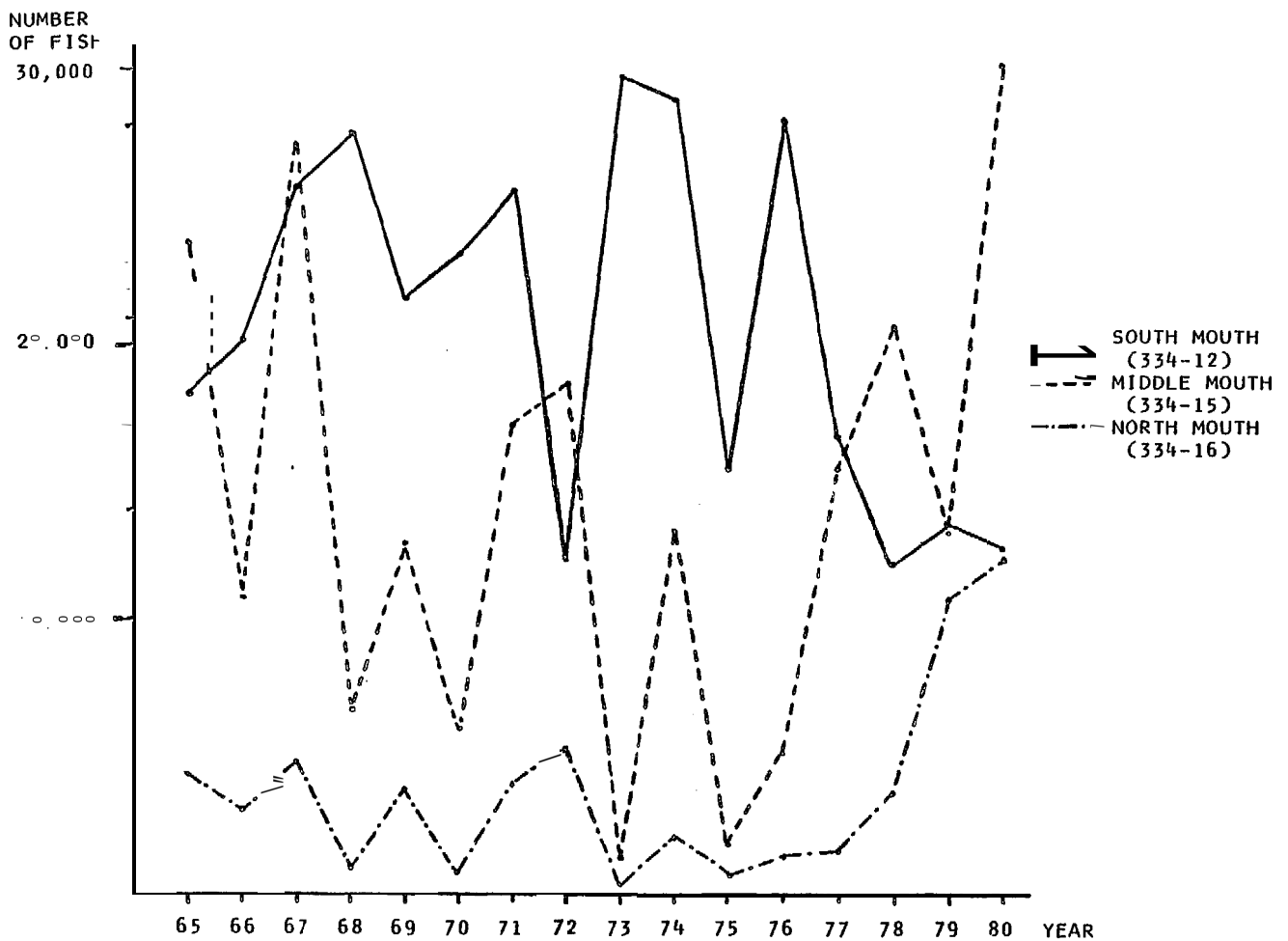


Figure 18. Commercial king salmon catches by statistical area, 1965-1980. (From ADFG Annual Management Report. Yukon Area. 1980. Appendix Tables 5 and 7.)

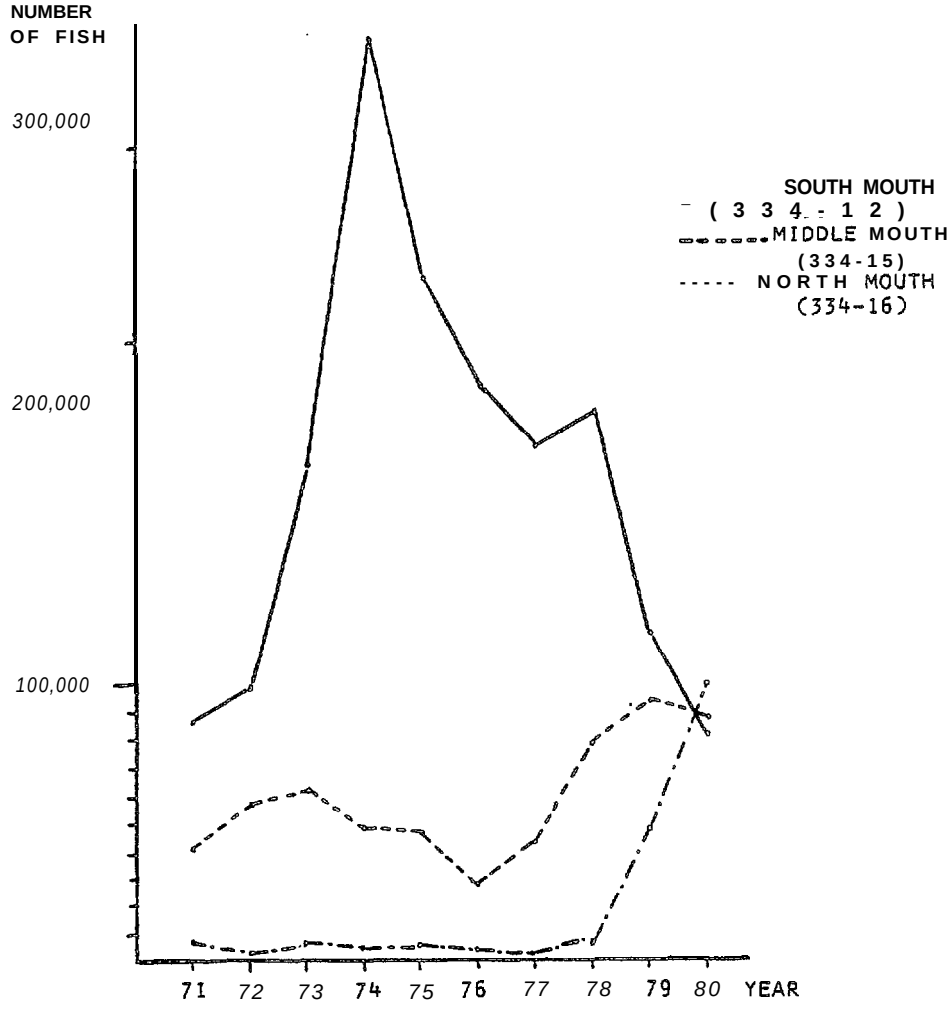


Figure 19. Commercial chum salmon catches by statistical area, 1971-1980. (From ADFG Annual Management Report. Yukon Area. 1980. Appendix Table 12.)

pounds of kings, chums, and coho salmon (Wolfe, 1979). In 1980, the same eight fishermen sold 188,716 pounds of salmon, representing an increase in commercial salmon output of 320 percent. Clearly, the 1980 salmon harvests at Kotlik and correspondingly high monetary incomes from commercial salmon sales (Tables 6, 8 and 9) must be considered atypical for this community.

Other sources of insecurity besides ecological fluctuations in the size of salmon runs also affect the regional economy. As previously mentioned, seasonal and annual variations in resource levels of other food species place constraints on food production by a household. For example, seal harvests during the study period (June 1980-May 1981) were considered to be relatively average; however, some years seals are relatively less abundant and harvest levels are depressed. The berry season of the study year was considered extremely poor in most areas of the delta. By contrast, salmon berry harvests were considered high during the late summer of 1981. Poor weather, water, and ice conditions during harvest periods also can reduce harvest levels. Spring and fall sealing are activities particularly vulnerable to variations in weather, water and ice.

External market and price conditions outside the control of local residents commonly affect the region% economy. Recent inflationary rises in the costs of gasoline have tended to restrict the mobility of fishermen and hunters with limited cash reserves, which in turn restricts certain types of subsistence pursuits. Increased equipment costs fore-

stall the purchase and repair of equipment by certain producers. Fishing and hunting is constrained by equipment failures of boat motors and snowmachines. Low market demand for salmon can depress the value of commercial salmon to local fishermen, as occurred for chum salmon sales during 1980. Prices for chum averaged between $.20 and $.28 per pound during 1980. Low external market demand for salmon severely affects the Yukon delta economy dependent on a single export resource.

Seasonal fluctuations in the availability of goods from retail stores affects most communities of the delta. The "bare-shelf syndrome" is a common experience within retail stores, especially during winter and spring. Communities report running low on, or completely out of products like gasoline, spare snowmachine parts, and certain types of ammunition required for hunting. Goods may be rationed at these times to households. Food products like flour, canned milk, and other staples at times are unavailable, so stores cannot always be relied upon to have food on the shelves.

The flow of income from government-supported projects and programs also cannot be relied upon as a consistent economic source. Community development projects providing seasonal employment in constructions such as in housing, schools, and public water facilities, are generally periodic! and short-termed. Federal programs like CETA and food stamp assistance typically expand and contract with changing government administrations and philosophies. Accessibility to income assistance by needy families reportedly is affected by the skills and case loads

of local social workers. All these factors influence the economic solvency of particular households from year to year.

Diversification in the economic production of Kwikpagmiut households has been a traditional strategy for dealing with periodic shortages within one or several resources. Households rarely specialize in one economic pursuit, but instead plan to invest labor and capital into several forms of production. If decreases in output occur in one source of subsistence or monetary income, then an intensification of effort in another area of production may yield increased output to help offset the decrease. Longitudinal data were not generated from this research to demonstrate these compensatory production strategies over a series of seasons. However, it is likely that Alakanuk households had to increase food output for certain local fish and game species during the June 1980 to May 1981 season to offset the poor commercial salmon earnings and curtail ouput of other capital-intensive hunting efforts. For instance, one household head reported no waterfowl harvests during fall of 1980. When queried, he replied he chose to spend his small salmon earnings to purchase heating oil rather than expend them in harvesting birds. Similarly, it is likely that the "wind-fall" salmon profits of certain Kotlik households during the summer of 1980 affected their subsequent pattern of production outputs. Suspected interrelationships must await empirical support. It seems probable that a flexibility between economic options traditionally has enabled the Kwikpagmiut to be successful in the face of short-term environmental and economic instabilities.

Over the long term, sustained reductions in particular local fish and game resources might entail significant economic and social costs. Reduced commercial salmon earnings over the long term might result in increases in state and federal welfare subsidies to the Yukon delta region. Of course, not all programs of income assistance are influenced by household income levels, but some, like the food stamp program and aid to families with dependent children, do consider income criteria. As shown in Table 9 , the Alakanuk sample with a $1,893 per capita earned income in 1980 received $2,426 in per capita income assistance from state, federal, and private sources; the Kotlik sample, with its $4,431 per capita income (primarily due to successful salmon harvests) received only $947 in per capita income assistance. These may suggest a potential relationship between long-term reduction in local resource levels and increased welfare dependency.

The human costs of increased welfare dependence in terms of reductions in psychological and social well-being, of course, cannot be calculated in monetary terms. The next few chapters describe how fishing and hunting activities were integrated into the social order of the family and community during 1980-1981 within the Yukon delta study area. They suggest that long-term reductions in particular resources might lead to changes in the social order with possible attendant psychological costs .

CHAPTER 5

KINSHIP SYSTEMS AND THE ORGANIZATION OF GROUPS AND NETWORKS FOR FOOD PRODUCTION AND EXCHANGE

Production and exchange of goods in the Kwikpagmiut economic system during 1980-1981, to a large extent, occurred within groups and networks of people recruited and organized through principles of kinship. The main functional units of food production on the delta, the primary economic "firms," were groups of persons putatively based on familial relationships. Most hunting, fishing, and gathering activities occurred within groups of people closely interrelated by the principles of kinship. In addition to production, the exchange and distribution of many economic goods also took place between networks of relatives. Therefore, to understand the organization of economic groups on the Yukon delta, one must understand how the Kwikpagmiut figure kinship relations.

This chapter presents a preliminary description and analysis of the Kwikpagmiut kinship systems as they appeared in 1981. This description is preliminary to a discussion of the actual organization of particular production groups and exchange networks in Chapters 6 and 7. The analysis of kinship here should be regarded as tentative, to serve as a basis for further research into the socially significant aspects of the Kwikpagmiut economic system. Social behavior can be organized and

understood at multiple levels, some openly public, others subtle and cryptic. This analysis only begins to tap the most public aspects of Kwikpagmiut kinship, and how it was used to structure certain forms of human activity.

Definition of Special Terms

Research on kinship in anthropology has produced a specialized theoretical vocabulary. As some of these terms may be relatively unfamiliar to persons outside the field, definitions of certain terms are provided prior to the discussion to assist the reader.

1. Affinal relationship: A relationship by marriage.
2. Bilateral descent: Descent relationship recognized by persons of a social group as deriving from both the male parent and female parent equally (as opposed to "unilineal" or "unilateral" descent which is descent recognized from one parent and not the other).
3. Consanguineal relationship% A relationship by birth or descent from a common ancestor.
4. Cross cousin: A person related to ego as father's sister's child or mother's brother's child.
5. Descent: The principle of being derived from (coming down from) a person or line of persons considered ancestors.
6. Ego: A hypothetical person chosen as a point of reference for discussing a kinship terminological system.
7. Nepotic kin: Person related to ego as sibling's children ("nephews" and "nieces").

8. Parallel cousin: A person related to ego as father's brother's child or mother's sister's child.

9. Terminological system: A system of ideas whose elements are named categories which are interrelated by a set of principles. A kinship terminological system is a conceptual system whose elements are named categories of persons (such as "aunt," "niece") which are linked by a set of principles (such as "descent" and "affinity") .

Kinship as a Conceptual System

In this chapter, a kinship system is regarded as a logical conceptual system relating named categories of persons. A kinship system is a set of ideas about how types of people are interrelated. The system of linguistic symbols and abstract ideas exists more or less as public knowledge within a society. As with most realms of cultural knowledge, it is expected that some individuals know the kinship system well, while others know only portions of the system.

Kinship systems are utilized by persons to structure social realities. People are placed within the limited number of known social categories of the kinship system. Once categorized in this manner, the distance and degree of significance of persons in relation to others can be estimated. The quality of conduct between two individuals may be anticipated depending upon the types of behavioral expectations associated with the social categories.

The methodology for eliciting kinship systems utilized in this study was derived from Leaf (1972), which approaches kinship as a system of definitions conveying social information rather than a system of basic "kin-types" transcribed from a set of genealogical relationships. The product of this methodology is a "kinship map," a basic pattern of definitions of a terminological system, representing a more or less complete set of categories for any person's relations,

A 'kinship map" is a pictorial representation of a kinship terminological system. The picture depicts how the named categories of persons (the "kin"terms) are related to one another by principles of descent and affinity. It is like a "road map" which is used to trace a route from one geographic location to another. With the kinship map, a person can trace a route from a hypothetical person ("ego") taken as a point of origin to all other kin terms in the system. That is, the map can be used to trace the interconnectedness of one kinship category with any other in the terminological system. A correctly drawn kinship map confers some degree of competence in using kinship terms. By placing a real person in the position of ego, one can discover what that person should call another in a social group by tracing a route on the map from one person to the other through intermediary kinship links.

Kinship Systems of the Yukon Delta

At least two systems of Yupik kinship terminology were being utilized by the Kwikpagmiut in 1981. These were in addition to the wide use of

American kinship terms in address. The terminological system elicited from key respondents at Alakanuk, Emmonak, Sheldon Point, anti Mountain Village is depicted in Figure 20, while the system elicited at Kotlik and Stebbins appears in Figure 21.

Differences and similarities in these two kinship maps are readily apparent. Why these two systems should appear on the delta are matters for further research. For convenience of discussion the kinship system at Alakanuk, Emmonak, Sheldon Point, and Mountain Village will be called the 'southern system" in reference to its representatives predominant location, while the *system* of Kotlik and Stebbins will be called the 'northern system."

Both southern and northern systems were similar in their treatment of ego's direct lineal kin relationships. Lineals were divided according to the principles of generation and gender. In the ascending line, lineals were distinguished by sex for three generations. In the . descending line, they were distinguished by sex for only the first generation.

It is notable that both systems did not distinguish paternal line of relations (ataka) from the maternal line (a'naka). The relations' of either "side" were considered equivalent. In traditional kinship theory, the kinship systems thereby incorporated 'bilateral" descent reckoning; that is, descent was traced equally through either the "maternal" or "paternal" side.

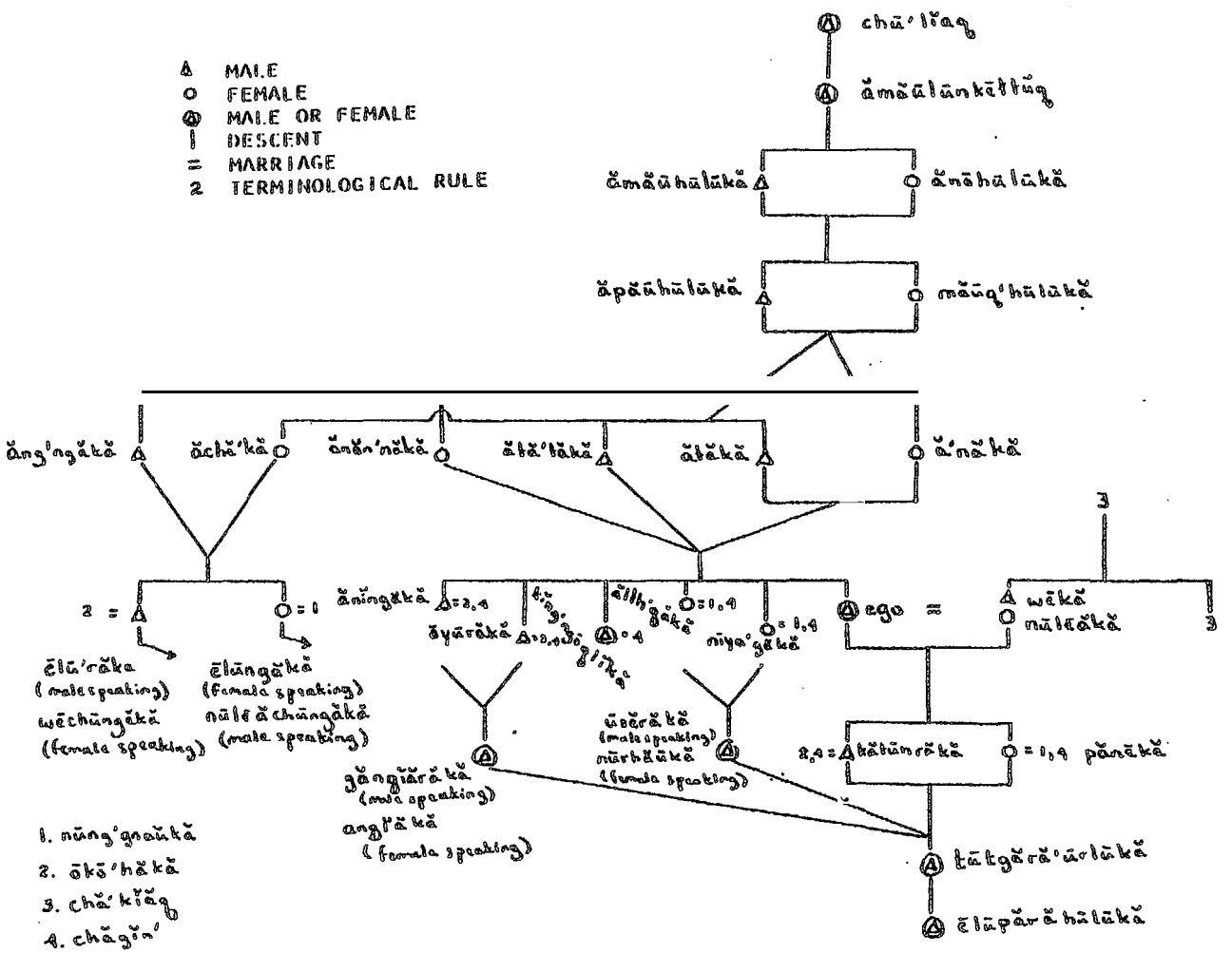


Figure 20. Yukon delta kinship terminology, "southern system" (Alakanuk, Emmonak, Sheldon Point, Mountain Village)

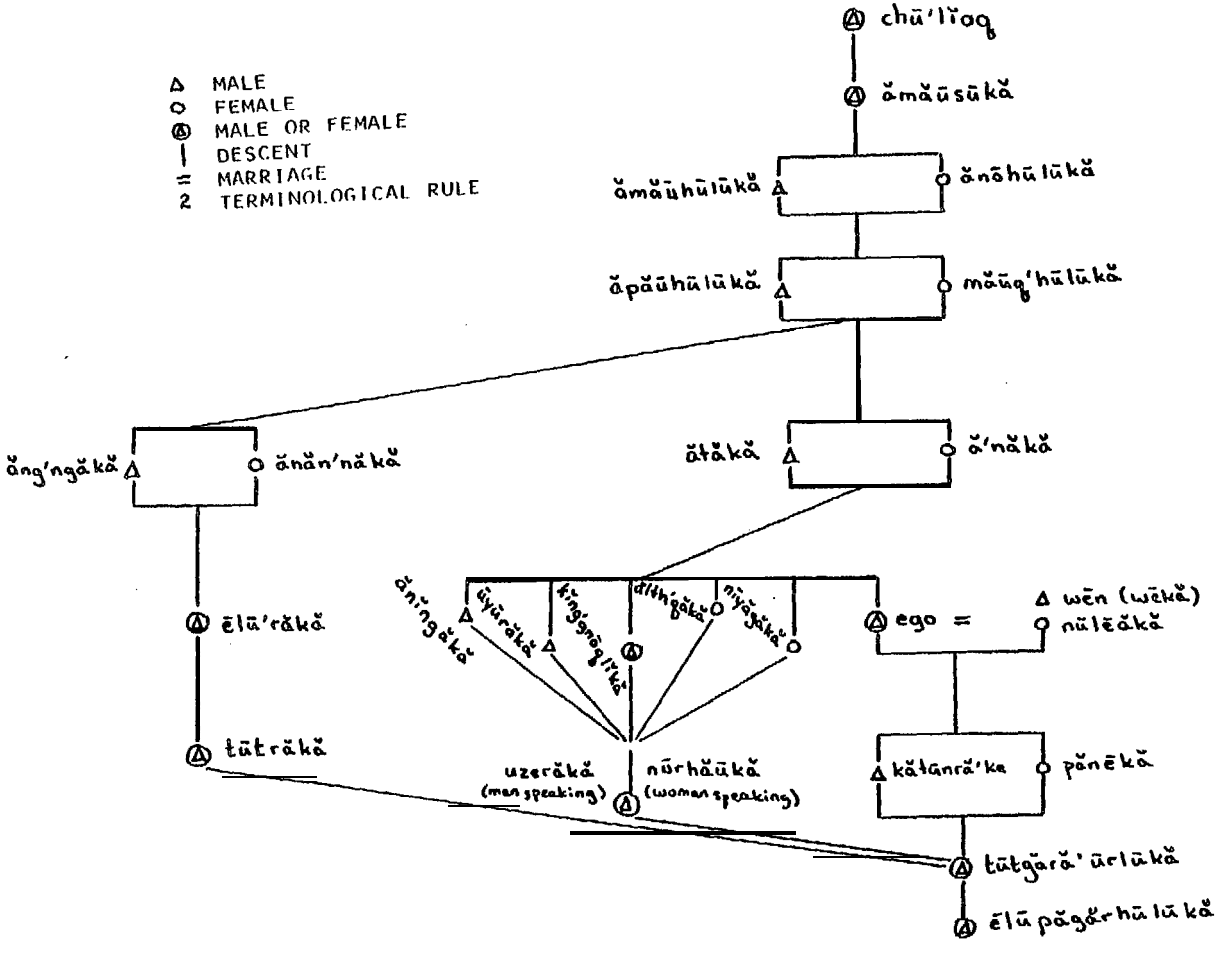


Figure 21. Yukon delta kinship terminology, "northern system II (Kotlik, Stebbins)

The southern and northern systems differed in the way collaterals were named and traced. All the terms of the northern system were incorporated within the southern system, but the latter identified a larger number of kinship categories frequently based upon the gender of the addressee or the gender of intermediary linking relations. The northern system either did not acknowledge these additional terms as categories of kin relations? or recognized the terms but defined them in some other way. Consequently? the northern system was the less complex of the two, and also the closer to the American English terminological system.

The northern system distinguished five sibling terms, based on gender and relative age: aningaq (older male sibling), uyuraq (younger male sibling), althqaq (older female sibling), and niyagaq "(younger female sibling). The term king'ngoqliq referred to younger siblings, either male or female, although most frequently it was used in reference to younger male siblings. Siblings were reckoned as offspring of ego's parents.

The northern system designated two terms for collaterals of parent's generation: ang'ngaq ("uncle"), and anan'naq ("aunt"). As with lineals, collaterals of maternal and paternal sides were viewed as equivalent. Children of parent's siblings were designated by a single term, eluraq ("cousin").

Collaterals one generation below ego were consolidated in this manner. Children of siblings were called uzeraq if ego were male, and nurhauq

if ego were female. Some respondents did not recognize the term uzeraq, but only acknowledged the term nurhauq. Children of eluraq ("cousins") were termed tutraq. At the second descending generations children of collaterals were merged into ego's descent line, becoming tugara'urluq ("grandchildren"), this term also designating children of ego's children. The term elupagarhuluq three generations down represented a terminus of the kinship map ("great-grandchildren," translated literally as "underwear," because, it was explained with a smile, by the time one has elupagarhuluq, a lot of underwear has been gotten into). The upper terminus of the kinship map actually was at amausuq at the fourth ascending generation ("great-grandparent"). The term above that, chuliaq, translated as "forerunners?" or "ancestors," and was not properly a kinship term.

The northern terminological system seemed to fit within the classical "Eskimo type" kinship terminology described by Murdock (1949). The formal features of the "Eskimo type" terminology were bilateral kinship reckoning, differentiation of "siblings" from "cousins," and differentiation of "uncles" and "aunts" from parentS. In these respects, the northern system resembled the American English terminological system, which is also of the 'Eskimo type."

The southern system differed from the northern system primarily in its treatment of collaterals. As can be seen in Figure 20, parents' siblings were divided into four classifications, those of the same sex as either parent conceptually closer than those of a different sex as either parent. This is illustrated by the interesting characteristic

that children of father's brother and mother's sister were regarded as equivalent to children of parents (ego's siblings]. Children of father's sister and mother's brother were regarded as separate from parent's children. That is, according to traditional anthropological kintypes, "parallel cousins" were terminological siblings, whereas "cross cousins" were terminological cousins.

Children of' ang'ngaq (mother's brother) and achaqa (father's sister) were distinguished from each other by gender, and received different designations depending upon ego's gender. Thus, four terms for "cross cousin" existed. Four nepotic terms (terms for sibling's children) also were used, distinguished according to the sex of ego's siblings. Some respondents only acknowledged two nepotic terms, useraq and nurhauq, claiming the other two terms (ganquiaraq and anqiaq) were Kuskokwim designations.

The consolidation of collaterals into direct lineals also occurred somewhat differently from the northern system. Children of cross cousins were conceptually equivalent with children of siblings (one generation below ego). Children of nepotic kin were conceptually equivalent with children of children (grandchildren, two generations below ego).

As is apparent, the southern terminological system used by the Kwikpagmiut did not correspond with Murdock's classical "Eskimo type." It resembled more closely the classical "Iroquois type," whereby cross cousins were differentiated from parallel cousins, the latter

frequently classified with sisters. In several respects, the southern system resembled the terminological system of the Nunivak Islanders as described by Lantis (1946), in which parallel cousins were classified as siblings, cross cousins distinguished from siblings, older siblings distinguished from younger siblings, with four separate terms for parents' siblings, four nepotic terms, and two terms each for grand-parents and grandchildren. It diverged from the Nunivak system in several respects, especially the four terms for cross cousins and the five terms for siblings.

Affinal relationships are depicted in Figure 20 as a set of rules. As can be seen, the term for "in-laws" marrying into ego's family was chagin, referring to persons marrying ego's siblings or ego's children. If the in-law were male, marrying ego's sister or ego's daughter, one called that person nung'ngauq. If the in-law were female, marrying ego's brother or ego's son, the term used was okohaq. Ego's in-laws through his spouse's side were called chakiaq, referring to ego's spouse's parents and siblings.

Some additional aspects to the southern system were these. Although eluraq referred to a man's male first cross cousin, it also was used in reference to any "distant" male relative of ego's generations and hence connoted the meaning of "friend." Literally, eluraq translated 'friend like a brother." Similarly, nuleachungaq referred to a male's close female first cross cousin, or to any 'distant' female relative of ego's generation. It translated 'dear little wife." Its reciprocal address term, wechungaq, translated "dear little husband." It was notable

that, as a general rule, cross cousin marriages were considered a union too close to ego, and so were prohibited. Siblings of grandparents could be called by the terms for grandparents. One technique used was adding the surname to distinguish between persons, such as "apauhuluka Smith." Because of this lateral inclusion, conceivably children of "grand uncles" could be reckoned as types of kin relations.

In the northern system, the term atataq referred to "step father," not father's brother. In the southern system, it could refer to either. In the northern system, elungaq referred to a female "friend," not a kinswoman. Men married to two sisters addressed one another as aqcheq.

Kinship Principles

How a kinship system relates to other social phenomena, such as marriage rules, residence rules, composition of residential groups, allocation of labor, distribution of power, and so forth, are matters for empirical research. Anthropological research has shown no one-to-one correspondence between the structural principles of a terminological system, and the organization of social groups and human behavior. An indepth analysis of kinship principles used in guiding human action and organizing social groups was beyond the scope of this study. Nevertheless, some tentative hypotheses can be advanced concerning the Kwikpagmiut kinship systems from the theoretical and empirical evidence. gathered within other societies.

In general, the principle of bilateral descent creates a kinship system which is ego-centered. That is, the set of persons recognized as kin by one individual is usually different from the set recognized as relatives by another individual. Only for young siblings is the sphere of relations identical. Within other descent systems (such as matrilineal and patrilineal descent), frequently a set of recognized kin is identical for a number of individuals. Thus the kin set is relatively stable while individuals move in and out of membership. Within the ego-centered system the individual becomes the point of reference around which the set is constructed. Thus, the individual and not the kin set is primary.

The ego-centered set of kin has been referred to as a "kindred" in the theoretical literature, a term which is used in two senses. In one sense a "kindred" has been used to refer to the entire set of persons one recognizes as relatives (Balicki, 1970). Accordingly kindred refers to a relatively extensive conceptual entity and not a tangible grouping of persons. Rarely does an individual ally with all one's recognized kin to create functioning groups. The kindred represents all the potential relatives one might ally with, of which many may never be utilized. In a second sense, "kindred" has been used to refer to a smaller set of kin regarded as particularly "close" to ego, such as parents, siblings, aunts and uncles (Schusky, 1972). Accordingly, kindred refers to the set of relatives an individual at times does ally with to form groups which perform particular functions and tasks. Bilateral descent systems have been found to be associated with functional kindred groups which are relatively small, transitory, and

variable in composition compared with non-ego-centered social groupings based on unilateral kinship principles or groups based upon nonkinship principles such as by contract. In the absence of other structural principles, a society may entrust considerable responsibilities to kindred groups, such as child rearing, food productions and political leadership. As a functional entity, a kindred may be manifested as a small household cluster composed of nuclear or extended kin relations. It has been suggested that bilateral descent and small functional kinship groups are particularly adaptive for hunting and gathering economies which frequently place a premium on high capacity for geographic mobility and low population densities.

A bilateral descent system also has the characteristics of' flexibility in relating persons by descent. Theoretically, twice as many people are available as relatives under a bilateral descent system than under unilineal descent, as persons from both the paternal and maternal sides are considered equivalent relations. The potential for flexibility in group formation is thereby increased. Theoretically, more people are available from which to draw work associates. Again, this may be adaptive to environments requiring flexibility in relatively rapid, short-termed linking of persons for meeting certain socially significant tasks.

A kinship system which makes fine differentiation among close relatives at the same generation suggests some importance placed upon these relationships. The differentiation of siblings in the Kwikpagmiut system is by sex and birth order. This suggests that perhaps

functional roles within the kindred are allocated by age and sex criteria. The group of female and male siblings may be central to the organization of the social system.

The southern system for classifying parallel cousins as siblings potentially increases the number of persons considered "close" by ego. This may increase the capacity for individuals to create alliances among close, allegedly 'trustworthy" persons for types of activity. It also suggests that two or more brothers or groups of sisters may create long-term alliances, whereby their children come to recognize themselves as closely related. It has been found that Iroquois cousin terminology is often associated with matrilineal systems of social organization, especially where the ownership of land is entrusted to a matriline. However, the southern system of the Kwikpagmiut in 1980-81 did not equate father's brother and mother's sister with the parental statuses, and so did not represent a bifurcate merging system like the Iroquois terminological system.

All these suggestions are purely speculative until more information has been collected concerning the use of kin relationships in Kwikpagmiut society. Historically, Kwikpagmiut communities were organized around the kaseaq, the fire-bath community house occupied by men, and separated from individual domestic units occupied by a woman and her children. How the traditional kaseaq organization was related to the kinship terminological system is still unexplained.

Generational Differences

It is important to note that the kinship system depicted above represented the terminological system known by members of the current oldest generation (generation one). Middle aged and young adult respondents (generations two and three) by and large did not describe their Yu'pik kinship terminology in the same manner as the oldest generation. As a rule, the younger the respondent the more confused the person was about the meaning of kinship terms at the "edges" of the terminological map. In particular, there was confusion concerning the proper designation of cross cousins, nieces and nephews, and lineal kinship above and below two generations. What this meant was that the terms for the "closest" relatives (parents, siblings, and children) were relatively clear and unambiguous; terms for more distant relatives were "fuzzy." Quite often a younger respondent would recognize a term (like eluraq) but not know its social referent, He might even use the term in addressing individuals without knowing precisely the genealogical linkages to the person justifying the designation.

The generational differences in the knowledge of Yu'pik kinship terms may reflect acculturative influences or simply age-related phenomena. Some older Kwikpagmiut ascribed to the acculturative explanation and expressed dismay that younger people were not learning to speak Yu'pik properly, but instead were using English terminologies. As one elder put it, 'young people get their father's sister and mother's sister mixed up nowadays." At Emmonak, the Yu'pik kinship system was being introduced as high school curriculum to counteract this perceived

trend. If the acculturation explanation is true, it becomes an interesting question about the ways the traditional Yu'pik terminology is becoming changed by Anglo-American influences.

However, generational differences may reflect only expected age-related differences. It may be that expertise in kinship knowledge traditionally was the purview of the eldest generation. One acquired more knowledge and experience with kinship terminology with age, so that during one's later years, the "full" system became known. If this were so, it is interesting to question the role of distant kin relations in Kwikpagmiut culture for the middle generations, when these individuals have not fully mastered the techniques for integrating persons using distant kin terminology.

As a final note, the northern system may represent an acculturative stage of change in kinship terminology. The north pass people have received more intensive social contact, being closer to the historical regional trade center of St. Michael, than were the south pass Kwikpagmiut. If so, perhaps the north pass Kwikpagmiut at one time held the southern system, which had changed to resemble the more classic 'Eskimo type" congruent with American English terminology. In support of this hypothesis is the apparent fact that Stebbins people, who originated from the Nelson Island area which also utilized a variant of the southern system, currently were using the northern terminology. Such a shift may reflect acculturative changes.

An alternative explanation is that the northern terminological system was. historically old, and represented the kinship system of the Pastoligmiut, the immediate ancestors of the people of Kotlik. If so, the Pastoligmiut may have been organized by a different kinship system than the south pass and main river Kwikpagmiut, posing an interesting question concerning social adaptation. If the kinship system to the north of Pastolik also represented the classical Eskimo type (as suggested by Burch, 1975), then Kotlik lay at the division between traditional kinship systems. In support of this view, elderly Kwikpagmiut respondents stated clearly that differences existed in Yu'pik kin terms on the Yukon delta. Older respondents frequently stated that, "this is how we do it here, but at so-and-so they do it differently; you must ask them to find out how it is done over there." These statements suggest that, like the dialectic differences that existed on the delta, differences between kinship terminology had developed within the region over a long time period.

CHAPTER 6

THE ORGANIZATION OF SALMON FISHING

The production of salmon, the region's primary food resource and marketable product, usually occurred within groups whose members were related by kinship. In the social systems of the Yukon delta, there was no radical separation of remunerative work activities and family life as frequently occurs in urban industrial societies. Rather, the economic pattern of fishing and hunting activities was organized around and within kinship groups. The primary economic "firm" during 1980-81 was a group of persons related through the principles of kinship presented in Chapter 5. The harvesting and processing of salmon was conducted within this set of relationships. The division of labor frequently occurred along lines of age and sex within this group. The proceeds from the cooperative production activities were shared within the economic family unit.

This chapter provides case examples of groups organized for the purpose of harvesting and processing salmon. The cases illustrate production organized along lines of kinship, as opposed to a set of secondary relationships based on contract. The cases were chosen to represent a wide range of variation in the composition of the salmon production groups. As will be shown, the social systems on the Yukon delta

allowed for flexibility in the recruitment of members to economic groups.

Production for Personal Use and Sale

In 1981 there existed two types of production units in the salmon fisheries of the Yukon delta--the kinship-basedfishing and processing unit and the non-kinship-based fish buying, processing and marketing unit. The kinship-based unit, to be described in this chapter, was the most common. It comprised a group of persons, usually related by kinship ties, who combined labor and material resources in the harvesting, processing? and selling of salmon. The non-kinship-based firm comprised a group of persons organized as a business, not a family, to buy, process, transport, and sell salmon to external markets outside the region.

This chapter will not describe the organization of the commercial fish buyers and processors on the Yukon delta, except to note their relationship with the kinship-based production units. In the lower Yukon River districts, there were thirteen main commercial operators in 1980, located primarily near Emmonak on the south pass, and near Mountain Village on the main river. As described in Chapter 3, two of the firms were owned and operated by local native corporations from Emmonak and Mountain Village; the others were based from outside the region. The firms engaged in buying salmon from independent fishermen, and processed it for sale, either as a frozen, fresh, canned, or salted

product. The processed salmon and roe were transported from the region by airplane or barge. Employees of the commercial firms worked for wages. The firms employed persons to buy, transport, and process fish, but not to harvest salmon. The firms bought salmon caught by independent fishermen who usually operated from one of the kinship-based production units. Fishermen were independent from the commercial firms in that they were, theoretically free to sell salmon to any of the commerical buyers operating in the vicinity. A significant proportion of persons employed by the commerical firms were local residents. Theoretically, these firms were composed of a collectivity of persons working for the firm and receiving individual reimbursement for personal effort, distinct from fellow employees. Income received in connection with the commercial fishery in fact tended to be viewed this way, that is, as the sole asset of the individual. Wages earned by a person cutting or transporting fish typically were described as "his own" income, not the automatic possession of a kinship-based unit. Similarly, salmon caught and sold to a commercial buyer was frequently viewed as an individual transaction separate from the kinship-based production unit. Income from the sale of commercial salmon was personal income. Members of a household typically did not know the commercial salmon earnings of other household members. Also, as will be illustrated in the following cases, persons fishing together usually divided profits from commerical salmon sales among themselves, even if closely related within the kinship-based group. Thus, the harvest and processing of salmon for external commercial markets were organized

along different principles than salmon production for personal use within family-based firms.

The Kinship-based Production Unit

A kinship-based salmon production unit could operate from a winter village, a fishcamp, or a combination of each, as described in Chapter 2. The size of the production unit varied, from a single individual up to a group of several dozen persons. A complete production unit, however, had at least one or two persons to harvest salmon, and another one or two persons to cut, dry, and smoke the fish. Harvesting and processing comprised complementary roles. A discussion of these roles follows later in the chapter. It was exceedingly rare for the person who harvested salmon to be the person required to process the salmon also.

The members of most salmon production groups were recruited through kinship principles. The group cooperating in harvesting and processing usually was a cluster of persons related through the kinship system. Not only were members recruited by kinship principles, but the group was perceived to be a kinship group. The response to the question, "What is the Yu'pik term for the people who live and work together at fishcamp?" usually was elakitraet, which means "family" or "relatives." A group perceived as representing "family members" therefore constituted a central economic unit within the Kwikpagmiut and Tapraqmiut cultures. The people termed elakitraet who lived and worked together

at fishcamp will be called a "kinship group" for the remainder of this chapter.

The elakitraet living and working together at a fishcamp (the kinship group) frequently comprised one or more household units linked by birth or marriage. A household was defined as a group of persons who resided in a separate dwelling at the winter community. Variations existed in how households were related, but usually the kinship group at fishcamp comprised a pivotal household of a father, mother, and children, plus one or more households of married sons or daughters. Another common organization was two or more households of siblings.

It is important to note that fishcamps frequently contained more than one kinship group. That is, several kinship groups frequently shared a fishcamp location. At times these groups could trace some kinship connections, but frequently no kinship ties were demonstrable. While sharing a single fishcamp, separate kinship groups frequently functioned as separate production units. That is, they possessed separate facilities for processing fish (racks, smokehouses), and harvested and processed fish for separate caches at the winter community. Nevertheless, cooperative pooling of fish harvests and labor commonly took place among all residents of a fishcamp. Members of different kinship groups frequently assisted one another as gestures of friendship, especially for companionship and assistance during periods of heavy workloads.

Accordingly, the social organization of salmon production units evidenced a high degree of flexibility. Salmon fishing was not locked into invariant structures. Rather, persons joined together for cooperative effort when such alliances appeared advantageous, building the associations with the flexible principles of bilateral descent and affiliation, or if no close kinship relationships were traceable, through concepts of friendship. A cooperating group most frequently comprised a shifting cluster of persons tracing bilateral descent ties and their spouses and children. Certain clusters apparently persisted over several years as fishing units. Others were relatively transitory groups, changing in composition from year to year, sometimes week to week.

The variation in the composition of salmon production kinship groups is illustrated in the following case examples. The cases have been selected to show some of the range of organizational possibilities inherent within the structural principles of the Kwikpagmiut and Tapraqmiut culture.

Case 1. This case illustrates a summer fishcamp composed of a single nuclear winter household. At camp were the 44-year-old head of the household, his wife, four of his six children, and his wife's sister's daughter, who was visiting. This camp had been at the same location for exactly 20 years. Originally, when the household head established residence, the camp was occupied by his wife's uncle and three households from St. Mary's. With the appearance of commercial buyers around

Mountain Village, these four households now fished from camps nearer St. Mary's. Now his household fished from the camp alone. Both he and his son, who also had a commercial permit, harvested salmon for commercial sale and subsistence use. The money earned by the son belonged to him, and did not become part of the father's earnings. Similarly, another son worked at the winter village that summer, earning money also for himself. The head of the household and his son brought fish to camp to be cut by his wife, with help of the children. The processed fish became part of the household's food cache, which was shared by everyone in the household including the sons (see Figure 22).

Case 2. This case represents a fishcamp composed of three winter households, all related, from two different villages. The focal household at this fishcamp was composed of a 51-year-old male, his wife, and three children (one adopted) living at home. Previously, his camp was located about 15 minutes away, near his wife's brother's fishcamp, but he moved to its present location 12 years ago. The two other households at the camp included his married son, daughter-in-law, and granddaughter, who maintained a separate residence at the winter community; and his married daughter and her husband, who lived at another winter village (see Figure 23).

The 25-year-old married son was just establishing himself at his father's fishcamp. That summer he was building a tent frame and furniture next to his father's tent. At the time, his wife and child were at the winter village, preparing to move to camp when he finished. The

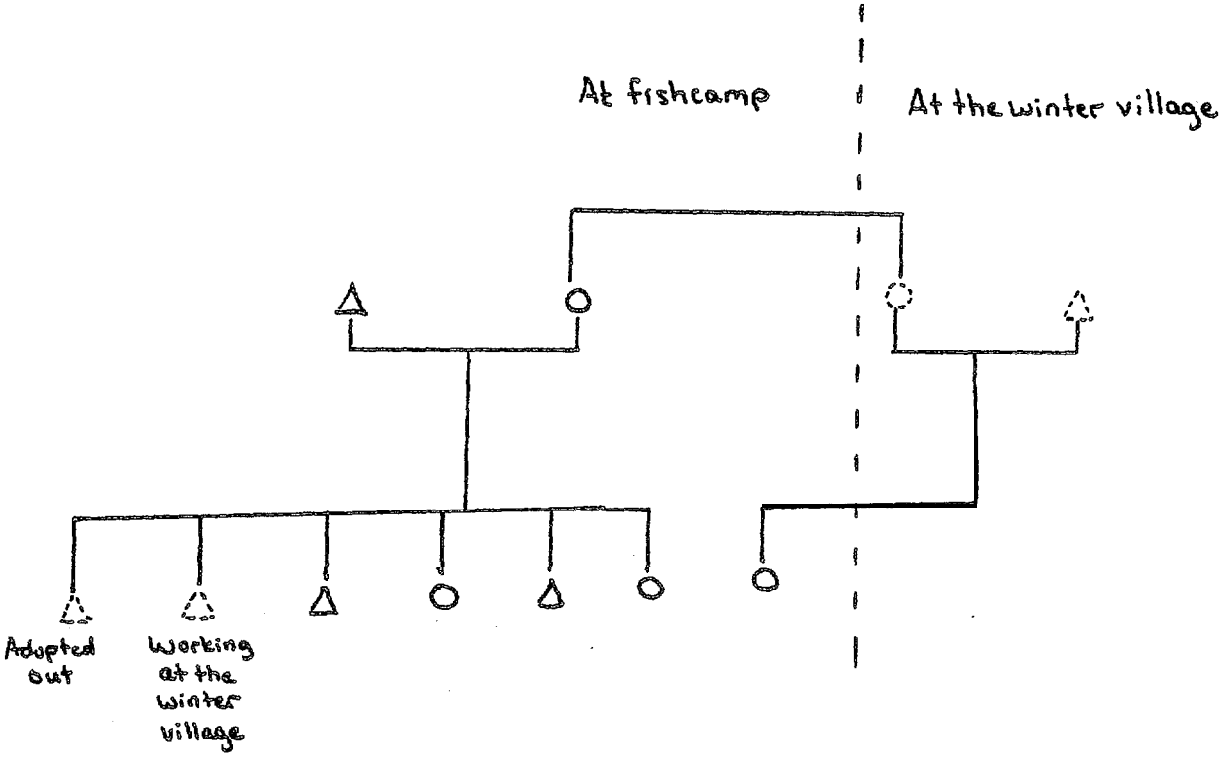


Figure 22. Fishcamp composed of a single nuclear household

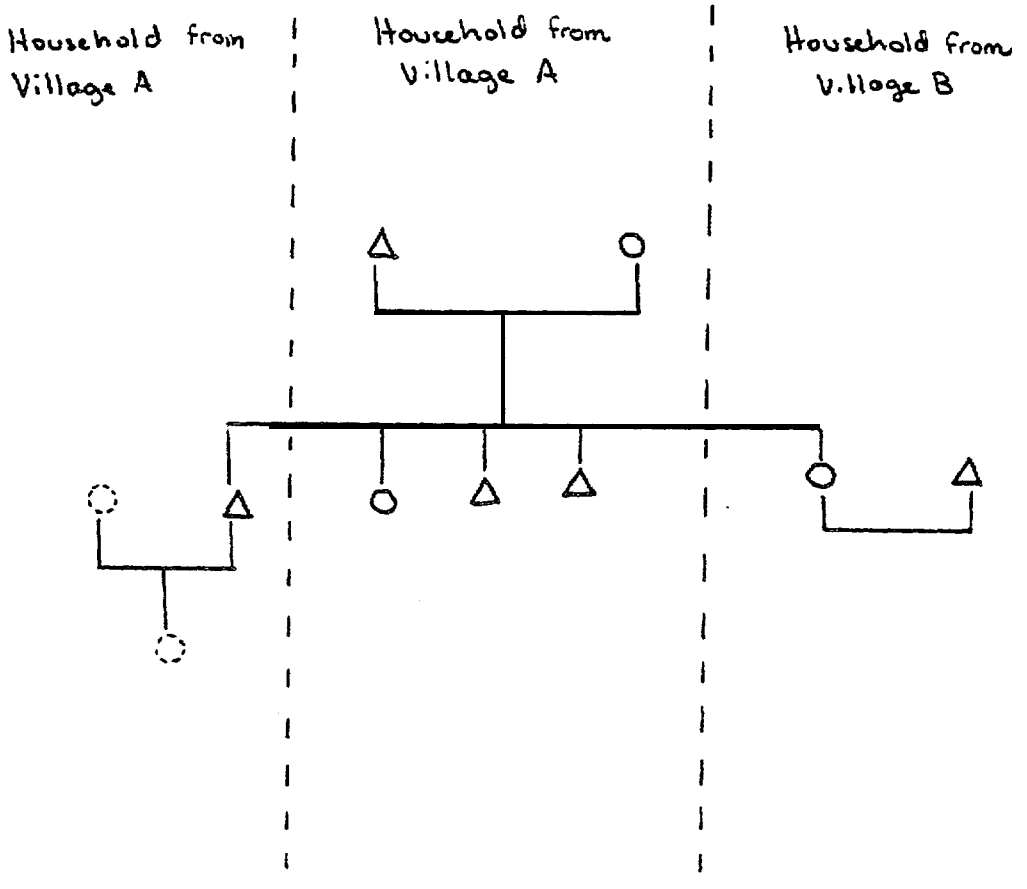


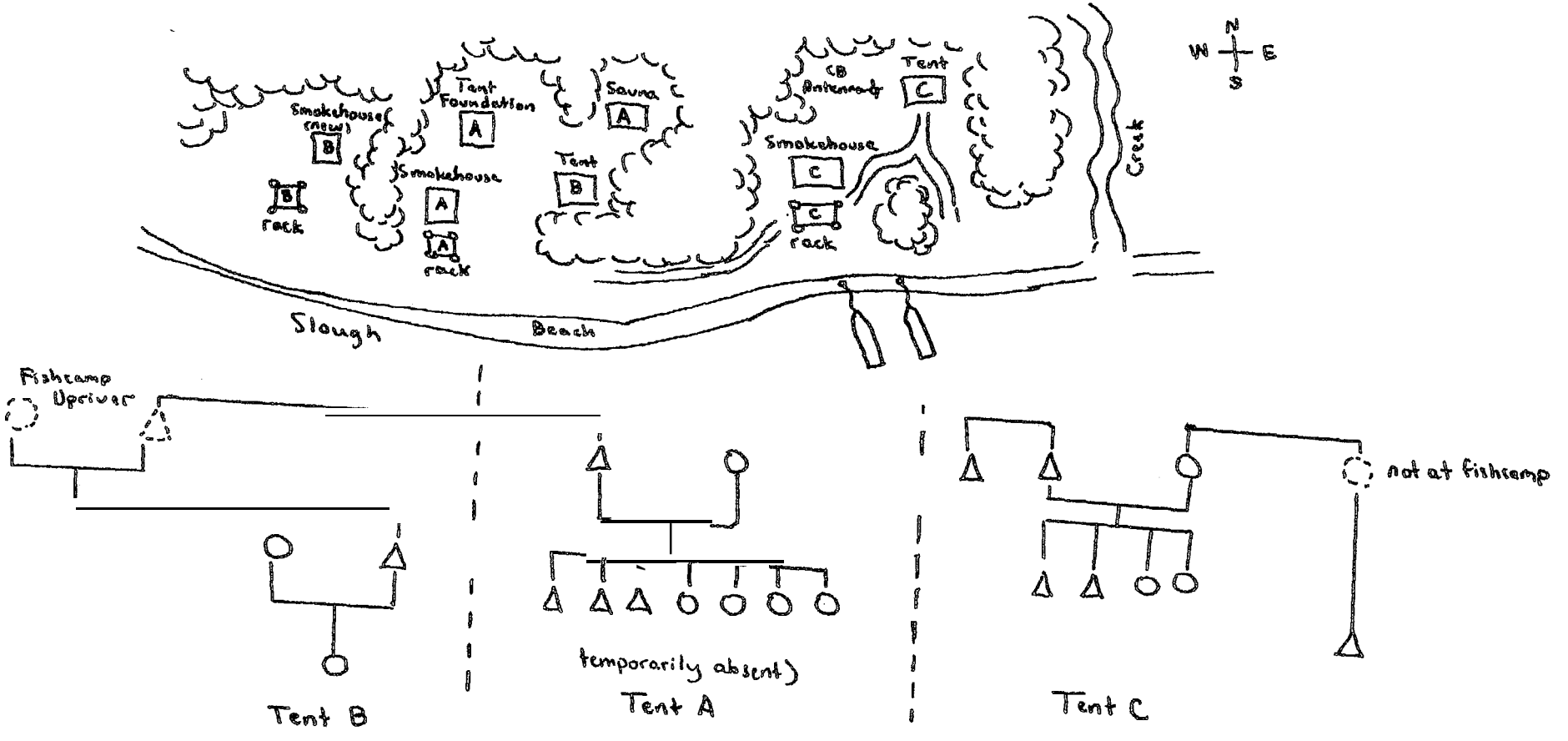
Figure 23. Fishcamp composed of three households from two villages

married daughter and her husband had not yet built separate tent facilities.

The 51-year-old father fished for salmon with his married son, and an unmarried son who still lived at home. Together in 1980, they caught about 1,200 kings and 2,000 chums and silvers for sale. Income from the sale of the salmon was split three ways between them. By contrast, salmon put up for home use by the women at camp (37 kings and 270 chums) were not split three ways, but were kept in a common cache at the home of the father and mother. The married son, although maintaining a separaate household drew salmon from the cache when needed. He stated that no one in the family needed to ask for permission to utilize food from the cache. The other household at camp caught and dried fish for use of their own household. It was stored at a cache in the other winter village.

Although pooling labor for salmon fishing, the father and married son primarily fished and hunted as separate units the remainder of the year. The father hunted seals in spring and fall with a partner 'related to his wife." The son hunted seals in fall and spring with two separate partners, "friends" his own age. The father set a net for small whitefish and set hooks for burbot. The son set his father's net for small whitefish at another time. Both hunted fur bearers separately, although the son gave the father his muskrats for sale. Father and son did hunt waterfowl in spring and fall together.

Case 3. This case illustrates a fishcamp containing three kinship groups each with its own tents, fishracks, and smokehouses (see Figure 24). The focal family group was not present when the camp was visited, his tent foundations bare and his racks and smokehouse empty. The 47-year-old household head of this family group was fishing upriver, planning to bring his household to fishcamp after the close of the commercial season to put up fish. At camp was the focal household's "paternal nephew" (his brother's son) and the nephew's wife and child. Previously, the 30-year-old nephew had been sharing the racks and smokehouse of his uncle, but he had recently constructed his own. The third kinship group was not closely related to the others. The 35-year-old head had fished from camps in that area for 19 years, making three moves during that time. He hoped this last location would be more permanent. Staying with him this summer were his wife, four children, his wife's sister's son, and his younger brother. He was grateful for his brother's presence, as he had sprained his back pulling fish. The brother was setting and picking the set nets as a registered helper in the meantime. His wife had been working at the winter village until the previous open period. Because of a heavy chum run which swamped the commercial buyers, he had been unable to sell several hundred chums he had caught. Rather than wasting the fish, he called his wife to camp to cut and hang them for the family's personal use. She complied, and consequently put her seasonal job with a local construction firm in jeopardy. At the time visited, the wife was cutting fish along the bank with her husband (she used the uluraq, he a straight knife). The husband% brother was out checking nets, and



Fi 24. Fishcamp composed of three household each with its own tents, racks, and smokehouses

delivering commercial fish to a tender moored nearby (this was at times a 3 to 4 hour wait). Two younger children were out gathering q'quqs, a type of root bulb gathered from the tundra, cleaned, and eaten "like potatoes." The fish they processed would belong to their own kinship group, as would the fish put up by their two neighbors at the camp.

Case 4. In this case, six households occupied a single camp location, with five tents, and three smokehouses (see Figure 25). The oldest household at this location, headed by a 37-year-old male, had been there about 12 years. Sharing the camp with him were his two younger brothers and their nuclear households. Therefore, the core of the camp structure was three brothers. The latest arrivals to the camp were two related households comprising 16 persons, all living within a single tent. This kinship group was not related to the three brothers in any close or direct manner. One household had fished the previous year at a fishcamp downriver, the other household had not been to camp in recent years. The sixth household at the camp was the second oldest brother's wife's parentis household, who were from another winter village than the other households. The households which shared smokehouses included the eldest brother's household with the newly arrived, unrelated extended family; and the second eldest brother's household with his wife's parent's household. The youngest brother's household used one smokehouse alone. From this camp, salmon was produced for five food caches, corresponding to each of the tents. Two of the sons of the newly arrived kinship group werre helping the eldest brother commercial fish as licemsed helpers.

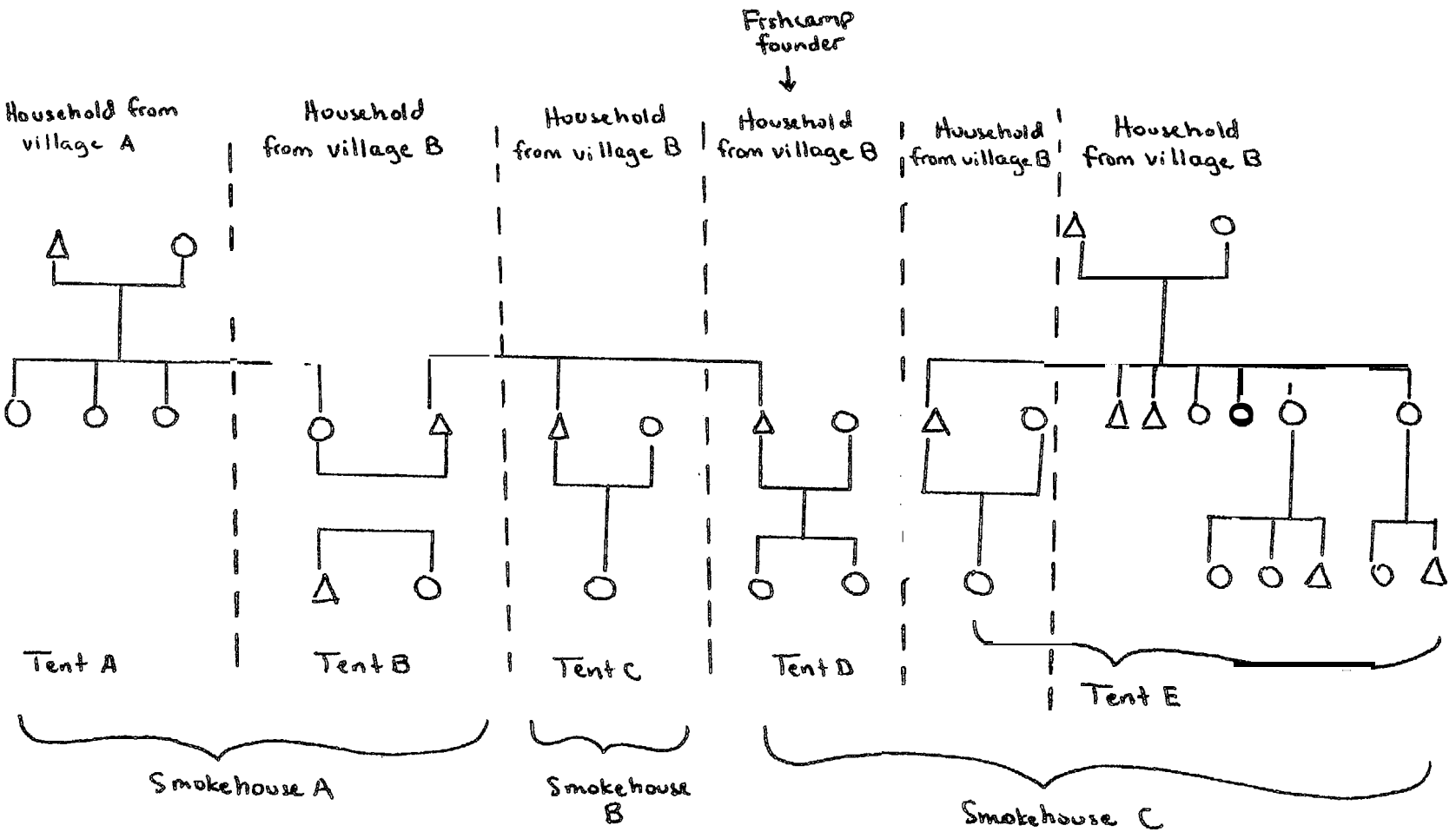


Figure 25. Fishcamp composed of six households, using five tents and three smokehouses

Case 5. This camp was across the river from Case 3 (see Figure 26). The fishcamp was occupied by four households all related to one central household. Two households were composed of a daughter, her husband and children, the other was composed of a son, his wife and children. Thus, the cluster represents both matrifocal and patrifocal organization.

Case 6. This case illustrates the pooling of resources and the division of labor in salmon production within two households at the winter village. At the winter village, the two households resided in neighboring houses connected by pathways which ran to the riverbank and a common fish cleaning area. The two households shared in common fish drying racks, smokehouse, cache, and racks for snowmachines. A third house in the cluster was vacant; a sauna lay behind one of the houses (see Figure 27).

The focal houshold A of this kinship group was composed of a 61-year-old man, his wife, two unmarried daughters, and two unmarried sons (the eldest in this household being 25 years old). The second household was composed of household A's married daughter, her 30-year-old husband, and two sons and a daughter. Thus, the male head of household B was attached to the household of his wife's parents.

For health reasons, the 61-year-old head of household A did not fish for salmon during 1980. In 1981 he had regained his health sufficiently to begin fishing the period of July 2, which was a month into

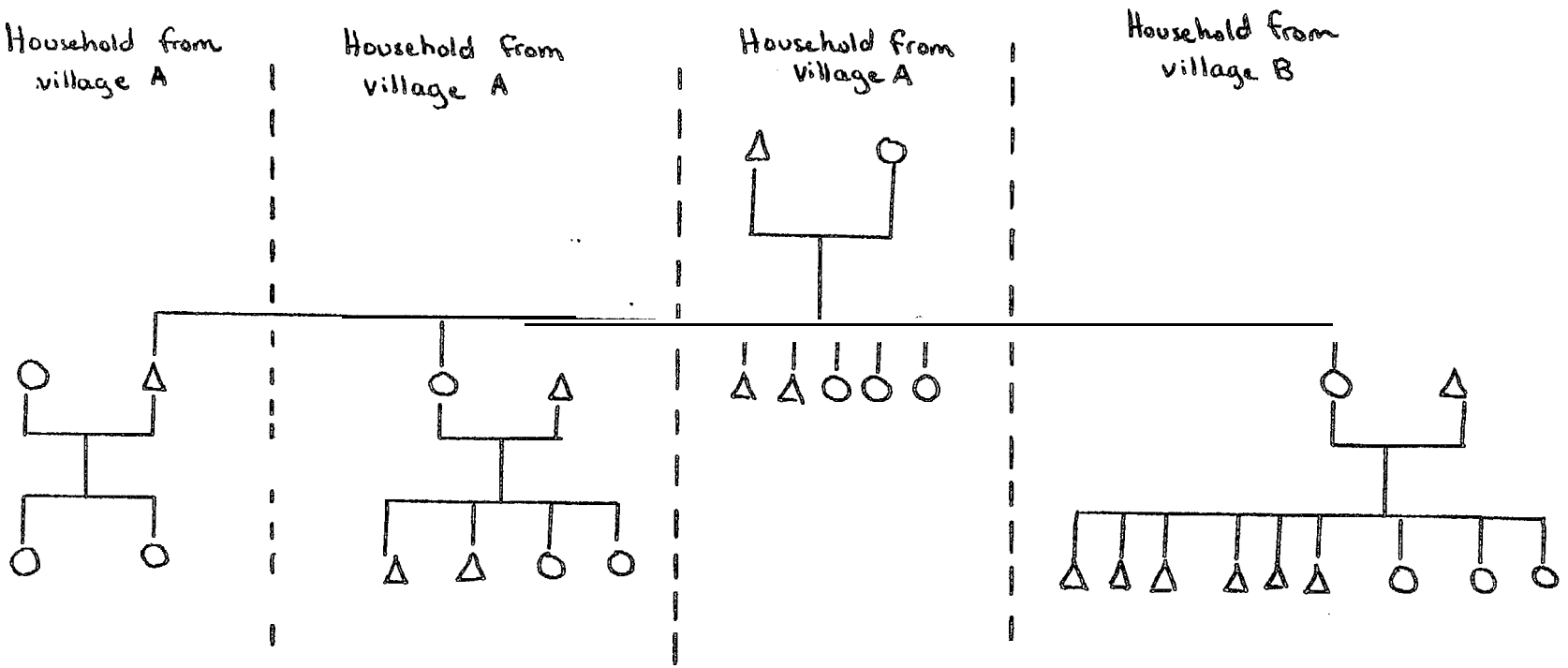


Figure 26. Fishcamp composed of four households from two villages

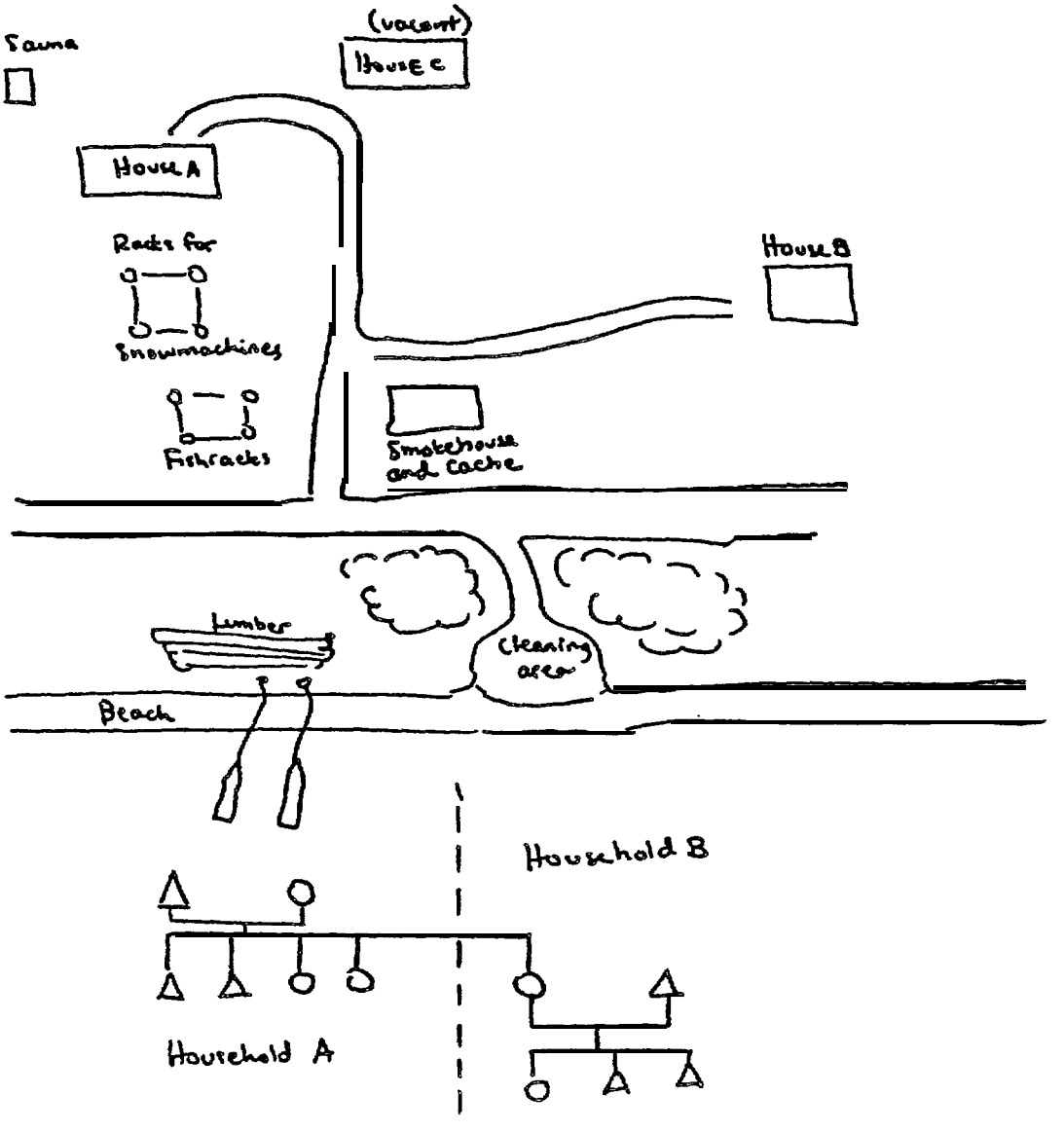


Figure 27. Cooperative group at a winter village composed of two households

the season. Last year his 25-year-old, unmarried son, who had a commercial license, brought the household salmon, as did his 30-year-old son-in-law next door. The son fished at a camp near the coast, occupied with "a buddy." The commerical income from the sale of 300 kings and 300 chums and cohos "belonged" to the son; however, he helped out with the family's expenses throughout the year. The son-in-law fished from a newly established camp elsewhere near the coast, which had drying racks, but no smokehouse as yet. He sold 234 kings and about 2,000 chums and cohos to provide income for his own household. His wife and three children accompanied him to camp before the commercial season opened and subsequently during open fishing periods.

Household B began drying kings for personal use before the commerical season opened. The fish caught in set nets at several locations (Casey's Channel, Blind Slough, and Tin Can Point) were cut and hung to dry at fishcamp by his wife. The air-dried fish were brought back to the winter village to be smoked at the smokehouse of the kinship group. At times, the head of household B sometimes brought fresh, uncut salmon directly to the winter village, to be cut and dried both by his wife and wife's mother, dried on the father-in-law's racks, and smoked. Thus, both the son and son-in-law of the head of household contributed to subsistence fish stores. The same arrangements existed in 1981.

When I visited on July 2, 1981, 4:00 p.m., I observed the following division of labor. The mother (household A) and married daughter (household B) were cutting chum salmon with uluraq at the cutting area

on the river bank. The salmon had been brought by the son-in-law (household B). As they worked, the head of household A arrived in his boat, filled with another boxload of chums he had caught. He left them in the boat and retired to the house. The two unmarried sons of household A were called from the house to haul the chums from the boat to the cutting area. The fish were first hung by the married daughter alone; then by the mother (household A) alone. Driftwood stacked along the beach was gathered by the father and sons of household A. Keeping the fire in the smokehouse going was the job of at least the mother and probably her children. The dried fish was held in common in the cache by the two cooperating households,

In this cooperating production group, neither young fishermen yet possessed a "complete" fishcamp. The unmarried son fished for his elderly parents, perhaps nearing a time of detachment from the household in the next 5 years or so. Currently, although keeping his own commerical earnings, he relied upon the labor and facilities of his parents and sisters to process subsistence fish, as well as to provide shelter, cooking, and other amenities.

The son-in-law was in the stage of developing his own fishcamp and independent production unit, but still relied on the facilities of the father-in-law as well as on pooled labor. Perhaps in time he will wean himself from this attachment, using his own rack and smokehouse solely, and relying on the labor of his wife alone in fish processing. However, centripetal forces keeping him involved with his father-in-law's

household included the obvious close personal relationship between mother and daughter, the close proximity of the houses (common yard and boat landing), and the poor health of the father-in-law.

It was not clear why this particular mother-daughter dyad worked as a production unit. There were other married daughters at the winter village, one living across the river. The mother mentioned with a sigh that she wished her children could live next door to her, in the third vacant house. The house apparently was to be occupied by her sister and sister's daughter instead. Probably the preferential arrangement would have been attaching another married child's household to the kinship group.

These cases should illustrate the variety of organizational groupings that existed in the harvesting and processing of salmon for personal use and commercial sale. The bilateral reckoning of kinship relations allowed for some of the flexibility in social group composition. Bilateral descent enabled offspring to be linked with relationships of either the paternal or maternal side. In addition to this, there appeared to be no preferential residence rules operating in relation to fishcamp location. At times, a household attached to the husband's parent's camps, at times the wife's parent's camps, and still other times, the household established its own fishcamp separately.

Within the social production unit, labor allocation and sharing of material resources also assumed a variety of forms. In general, labor

was frequently pooled in the production of salmon. However, food caches generally were held in common only by a parent's household and parent's children's household. It was unusual to see the sharing of a cache by two households of the same generation without the existence of the intermediary parental link. That is, while the households of siblings commonly pooled labor in salmon production, it was unusual for them to pool the product in a single cache. The households of siblings generally produced separate food caches. More distant relations also commonly pooled labor and resources, but rarely shared common food caches.

In conclusion, of particular significance is the fact that the economic and family systems were closely intertwined during 1980-1981. That is, the form of the kinship-based unit during summer frequently was adapted to the requirements of the major economic activity, fishing and processing salmon. Conversely, fishing and processing salmon was perceived to represent activities by family members and was organized following kinship principles. Economic activity, therefore, served to structure familial activities, and vice versa. This point is an important one, for modifications in the economic pattern of fishing and hunting would change the functional patterns of the basic kinship groups. Disruptions in the regional economy would represent disruptions of the region's central social groups.

The Functional Integration of Roles by Age and Sex

As is illustrated by the case examples of salmon fishcamps, the division of labor in subsistence activities commonly was allocated along sex and age lines. Whereas kinship criteria often were used in the recruitment of a group of people for cooperative work in food productions sex and age criteria frequently were considered in the allocation of specific occupational tasks or roles. Labor was partitioned into complementary functional roles enacted by persons of different ages and sex. The integration of functional roles was apparent in subsistence pursuits in addition to salmon fishing activities.

Sex-related Roles

Most fishing and hunting was performed by men, while women supplied essential support services in food processing for storage and consumption. By and large, male occupations included fishing with nets for salmon and non-salmon fish species; hunting for sea mammals, birds, and moose; and trapping. Females produced foods in the occupations of plant gathering, egg gathering, and jigging for fish. Female support occupations included cutting, hanging, and smoking fish; cutting small seals; preparing seal skins; plucking birds; meal preparation; and baking bread. Men commonly cut up large sea and land mammals for transport, and skinned and stretched pelts. Other male subsistence-related activities included boat construction, boat motor repair, net mending, and manufacture of harpoons, spears, and fish traps. Women

made parkas, winter and summer boots, and other clothing items from imported material. The craft industry, items for sale on outside markets such as baskets, earrings, throwing boards, wooden bowls and ladles, was small on the Yukon delta in comparison with other Eskimo communities to the south. In general, men operated boats and snow-machines when household members traveled. Women frequently were provided transportation by males when gathering plants or eggs.

None of these divisions of labor by sex was rigid. Almost all activities listed above were performed by men and women alike at times. Women and men commonly showed considerable skill in activities allegedly ascribed to the opposite sex. In the absence of adult males, adult females commonly ran a household and performed many of the activities related to fishing and hunting, such as setting nets and shooting birds. Similarly, a man at times substituted for a woman if she were absent, sick, tired, or pregnant. Both men and women assisted one another if workloads were large, or simply for the company each gave the other. Men and women teams in catching fish and hunting sea mammals were not uncommon.

Some residents claimed that the sexual division of labor was more strict in the past. However, others felt that even traditionally men and women performed each other's tasks as situations might dictate. Reciprocal roles among men and women thus appeared to be a convention which allowed considerable freedom in practice. Marriage in part was understood to be a method for a man and woman to form a complementary work unit.

Unmarried men commonly brought food to mothers or sisters for processing and preparation.

Age-related Activities

In addition to activities related to sex roles, performance of certain occupational tasks tended to be influenced by the age of the worker. Age commonly reflected a person's level of physical strength; skill in buntings fishing, and food preparation; knowledge of game and terrain; the nature of social responsibilities; and the ownership of equipment and operating capital. Persons of different ages with different skills and resources tended to support one another in production and exchange activities within kinship groups. Large food producers tended to contribute food to persons whose food output was relatively smaller, as is discussed in the next chapter. Skilled and capable fishermen and hunters tended to contribute labor in lieu of persons with reduced capacities within kinship groups. Knowledgeable persons contributed counsel and guidance to those less knowledgeable. And kinsmen with equipment and operating capital frequently utilized it for the benefits of those without.

Production responsibilities within a household were allocated among members in particular ways. Members of the youngest generation (birth to early teens) produced the least food directly. Children frequently accompanied parents and siblings in fishing and hunting activities but mainly as interested onlookers and learners and secondarily as workers.

The role of children in direct subsistence ouptut was in the capacities of support services, such as carrying water for cleaning fish, scrubbing boats, assisting parent in catching, cleaning, and hanging fish, and meal preparation. By the early teens, persons have had direct experience with most subsistence-related activities. Adolescents and young adults increasingly participate in subsistence pursuits with age. Activities especially performed by adolescents and young adults included snaring rabbits, shooting ptarmigan, jigging fish, shooting muskrats and waterfowl, dipping smelt, assisting in catching and processing salmon, and working at seasonal wage employment. Full participation in a wide range of production activity generally occurred at about 30 years of age, this decade marking the most productive years of a male fisherman and hunter.

The shift in subsistence roles is suggested in Figures 28 and 30. Figure 28 depicts subsistence outputs during June 1980 to May 1981 of males, by age, averaged within 10-year age ranges, for members of the sample households at Alakanuk. It shows the beginning of appreciable subsistence ouptuts to be about the age of 15, increasing substantially during the 20's. Production output of a fisherman and hunter jumped markedly at about 30 years of age. The most productive decades for male hunters were between the years 30 to 59. After about 60 years, subsistence output dropped considerably. Nevertheless, significant food output continued into the last decades of a person's life. Figure 30 depicts the output per household for the same Alakanuk sample by the age of the household head, averaged within 10-year age ranges.

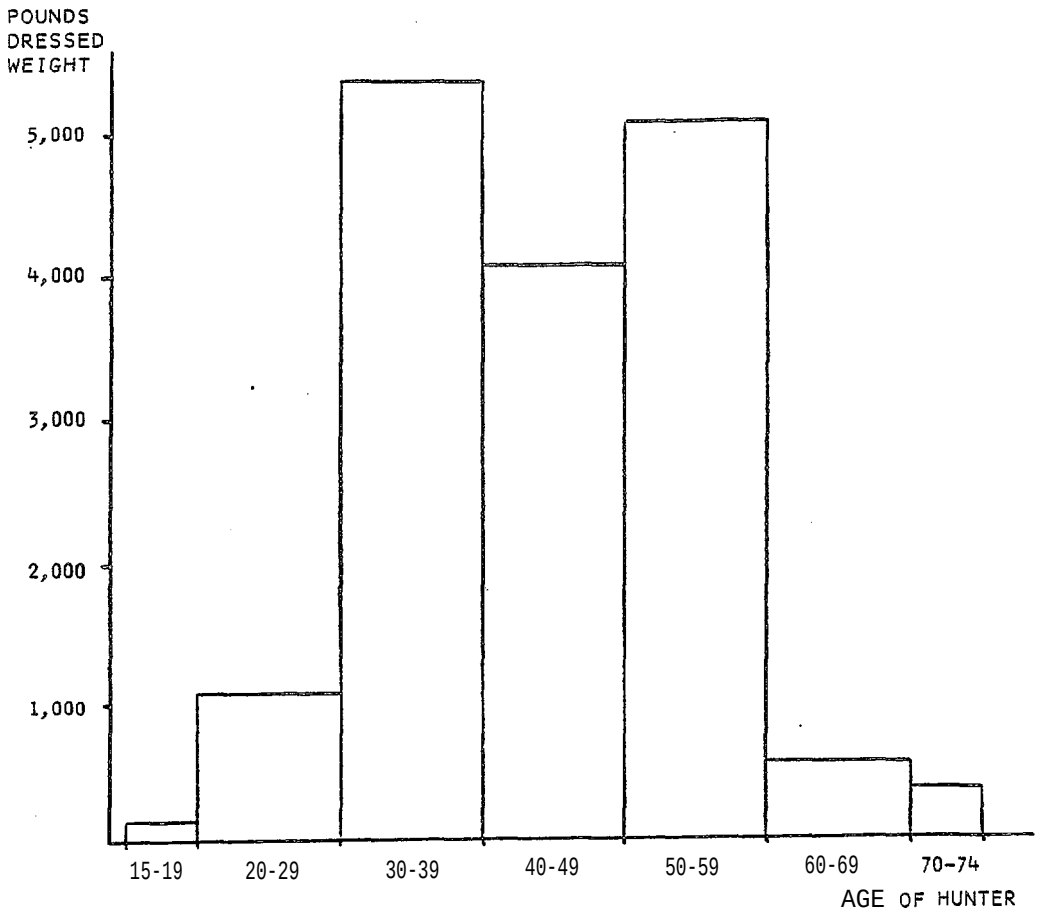


Figure 28. Subsistence output by age of hunter, Alakanuk. (June 1980-May 1981, averaged within 10-year age ranges.)

It shows that households with heads between 60 and 69 produced an average of 3,000 pounds dressed weight of subsistence foods. Comparing Figure 28 with Figure 30, approximately 500 pounds of this output was produced by the head of the household. Most food produced within these households was by unmarried males in the family who had assumed productive roles.

Within the prime middle adulthood decades (30-59 years), subsistence activities also were affected by age. Most production of seal oil and meat was done by men in their 30's at Alakanuk during 1980 to 1981 (Figure 29). Seal hunting was a relatively strenuous activity which offered challenges to a person's skill and strength, conditions which appealed to this age range. By contrast, most production of non-salmon fish species was done by men in their 50's at Alakanuk during 1980 to 1981 (Figure 29). Non-salmon fish species, by and large, were taken by set nets and fish traps during fall and winter, activities requiring moderate labor expenditures of which an older person would be capable. Waterfowl harvests showed relatively stable harvest levels across the middle decades, representing a third age-specific pattern. Thus, men of particular age ranges tended to specialize in the production of certain food resources and shared their harvests within the household group. Chapter 7 describes how substantial quantities of food also flowed between households groups as well.

Elderly persons in a community become less involved in direct subsistence production with advancing age, as shown in Figure 28. As is

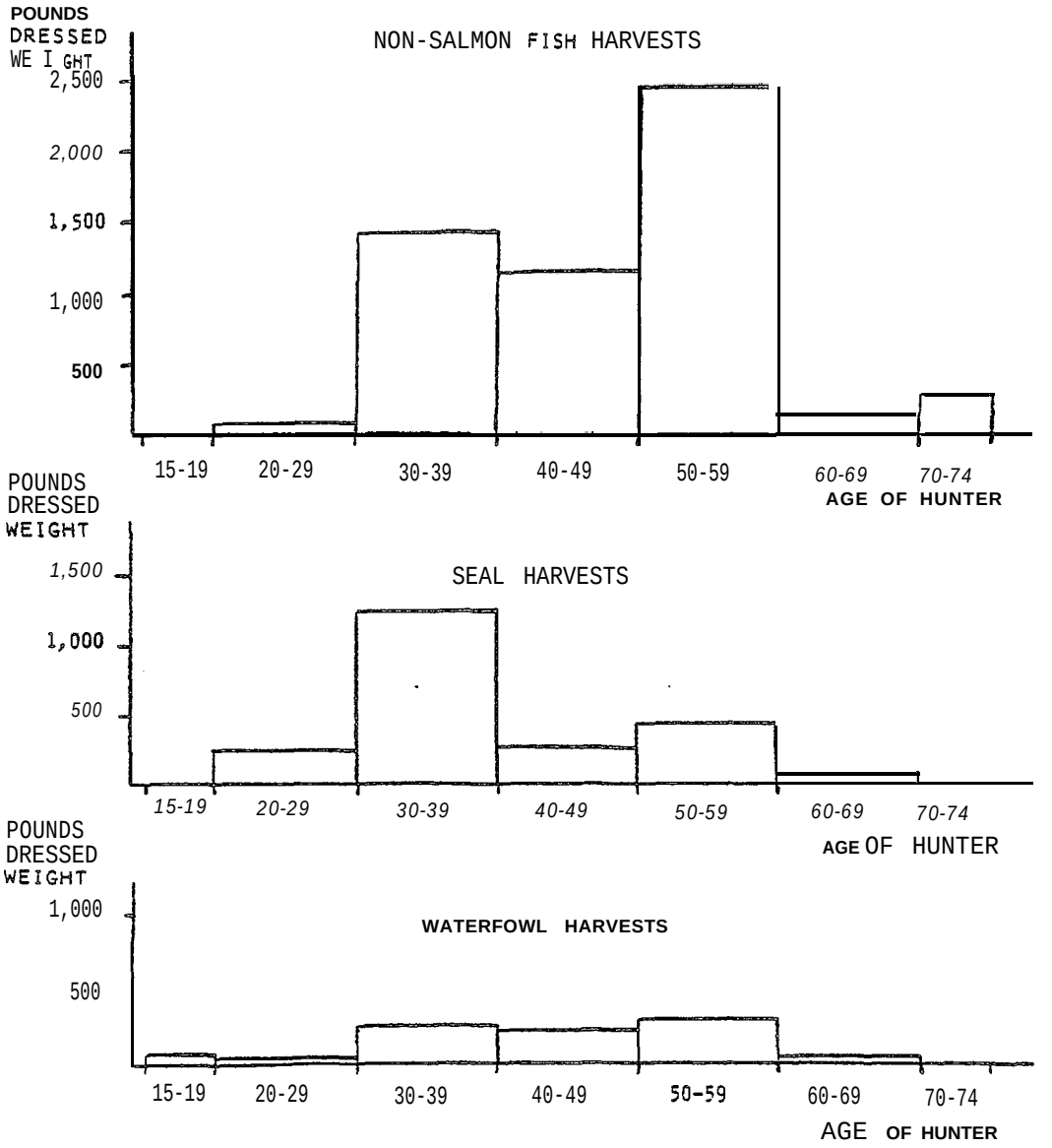


Figure 29. Subsistence harvests of non-salmon fish species, seals, and waterfowl, by age of hunter, Alakanuk. (June 1980-May 1981, averaged within 10-year age ranges.)

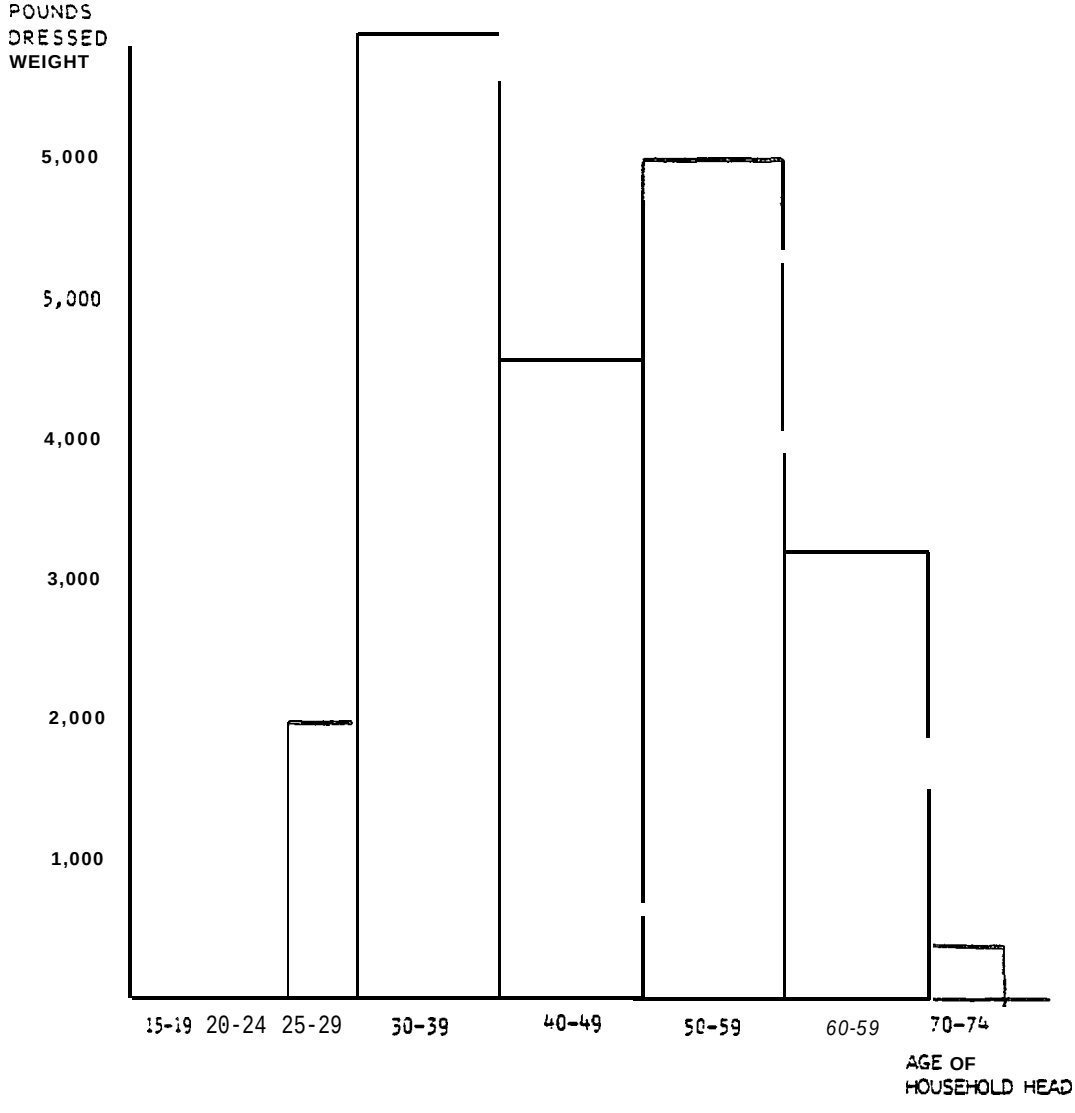


Figure 30. Subsistence output per household, by age of household head, Alakanuk. (June 1980-May 1981, averaged within 10-year age ranges.)

described in Chapter 7, children regularly supported parents with food produced within their own households. Nevertheless? elderly persons often continued to set nets and traps and jig for fish during fall and winter, snare hares during winter, and gather plants and berries during summer, despite substantial disabilities in physical function. Elderly men commonly provided support activities such as mending nets for younger sons and crafting spears, harpoons, and traps. Frequently grandchildren accompanied the elderly in their subsistence pursuits, assisting in transportation picking nets, hauling fish, and other support activities. The elders in a community were held in high respect for their past experiences and greater knowledge by younger persons, and were frequently consulted concerning fishing and hunting techniques strategies and locations. Thus, they participated indirectly in the production of food in the community.

It was hypothesized at the beginning of the research that the increased participation in wage employment by children might lead to an increased isolation of the elderly generation. Cash earnings did not seem to flow as readily within and between households as subsistence food income. Further, the elderly might be less able to contribute to the success of wage employment through wisdom and ancillary services in comparison with contributions to subsistence activities. However, general observations during 1981 did not seem to support this hypothesis. By and large, most elderly persons' houses were frequented by relatives and the elderly and their children seemed to participate in each other's affairs. Working at a wage occupation by children did

not seem to make any difference in this pattern. As of this time, data do not support the possible influence of increased participation in the market economy on the functional roles of the elderly.

CHAPTER 7

SHARING AND EXCHANGE OF FOOD RESOURCES

In addition to food production by fishing, hunting, and gathering activities, food resources were acquired by Yukon delta residents through systems of distribution and exchange. A significant portion of the food resources produced by a person or family flowed out to other individuals as items shared, given, exchanged, and sold. This flow of food products occurred extraneous to retail market channels. Food resources passed between individuals, families, and communities through traditional distribution and exchange activities.

Giving and receiving food were basic to social relationships within the culture of the Yukon delta in 1981. Food products flowed so frequently between individuals as a part of normal social interaction that it seemed doubtful that any significant social relationships existed without associated food transfers. Most sustained interaction between persons included the mutual exchange of food resources. The giving and receiving of food typically communicated a set of ideas and sentiments between the giver and receiver. That is, the biologically related act of food sharing expressed a complex of symbolic meanings concerning the structure strength, and quality of social relationships.

This chapter describes in general terms distribution and exchange activities within the Yukon delta study area in 1981. The information should be taken as suggestive of the types, magnitudes, and symbolic meanings of these activities within the cultures of the Kwikpagmiut and Tapraqmiut. More extensive research is required to validate the general statements made here. The study's short duration, and design calling for substantial movement between communities, mitigated against the systematic collection of information on systems of distribution and exchange. The types of information presented here represent unsystematic, qualitative observations on the giving and reception of food during the short field stay, interpreted with general verbal accounts by residents concerning the activities as they perceived them.

The design precluded quantitative data collection on exchange relations (cf., Johnson, 1978). Information on distribution and exchange based on an informant's retrospective recall was inadequate for constructing exchange patterns. Most individuals could not, and did not, keep track of food transfers, as the giving and receiving of food was so common a component of everyday relationships on the Yukon delta, and occurred so frequently in a variety of contexts. (As an analogy, it would be similar to asking an urban American to recollect the number of phone calls made and received, and with whom, *over* the past year, without referring to a phone bill.) Furthermore, keeping accounts of quantities of food given and received frequently was contrary to the spirit of the act, akin to evaluating the worth of birthday, Christmas, or wedding gifts in urban American culture. The types and flow of food

were not properly subjected to a rational calculus; a person demonstrating such knowledge revealed something concerning his understanding of the meaning of giving and receiving. A more fruitful methodology for describing this aspect of Kwikpagmiut and Tapraqmiut cultures would entail long term observations within a single social setting. Then it might be possible to trace the disposition of food products within a community--where foods went, who consumed them, and within which context. An understanding of the symbolic meanings of giving and receiving food would require a deeper understanding of the culture and psychology of the residents of the Yukon delta.

However, describing the distribution and exchange of food resources even in general terms is instructive. It informs that residents of the Yukon delta were interconnected within a network of relationships along which food resources flowed. Food rarely stayed solely within the social unit that produced it, but typically flowed out to others. Through the pattern of food transfers, all the communities of the delta were linked. Thus, the delta's economy must be understood from a larger regional perspective when considering the final disposition of economic goods. The alteration of food production in one sector of the delta might hold ramifications for other parts of the regional distribution network.

Examples of Food Sharing

Consuming food not produced by oneself was a common experience on the Yukon delta. The pervasiveness of food exchange is suggested in the following three case observations made during the summer of 1981.

Case 1. The researcher ate his first meal in the Yukon delta area in the late spring of 1981 with a family at Stebbins: dried broad whitefish and pike dipped in salt and peppered seal oil. The food was not produced at Stebbins, but had arrived by plane in a cardboard box, sent by the wife's parents from St. Mary's. The next night the Stebbins household enjoyed a meal of herring roe on kelp dipped in seal oil, received as a gift in a paper sack from a friend in the village who had picked it that day from the rocky coast of Stuart Island. The day following, munduq (raw belukha epidermis) dipped in seal oil was the main dish, given to the household by a successful hunter in the village. Thus, the first three consecutive evening meals for the researcher contained food products given the host household as gifts.

Case 2. An August hunt with two men from Kotlik and Stebbins yielded several ducks and one goose. The next evening the researcher noted that the birds were gone from the house. Upon inquiring, it turned out that half had been sent up the coast to the Pikmiktalik River to be given to the Stebbins hunter's parents and to his father's brother% wife's sister. Of the other birds, three were cooked and served to the Kotlik hunter's family (wife and four children), the remainder given to

his parents (who lived in Emmonak), and his wife's sister (Figure 31). In all, the waterfowl had been distributed among six separate households in three different winter villages. The hunter saw nothing noteworthy about the birds' dispositions, and wondered at the researcher's attempts to trace them.

Case 3. During an interview with the head of an Alakanuk household it was mentioned in passing that the household had received the following foods: smelt from his mother's brother; dried chum from his mother; waterfowl from his wife's father; moose from his brother; ringed seal from his sister's husand; and bearded seal as pieces shared during a hunt. He in turn had provided blackfish, saffron cod, and arctic hare to each of the households. When I produced a flow chart of these transactions? the household head was unimpressed (Figure 32). From his assessment, the chart nowhere approached a complete depiction of the food he received or gave the past year; he had shared a greater range of food types with a wider sphere of' persons.

Although anecdotal, these incidents suggest the frequency and complexity of food exchange and illustrate the variety of foods involved. The cases seemed typical of the kinds of food transfers that occurred daily among residents of the delta.

Food resources were given and received in a number of culturally defined contexts. Three primary categories of sharing are briefly discussed and illustrated below: food given as unsolicited gifts

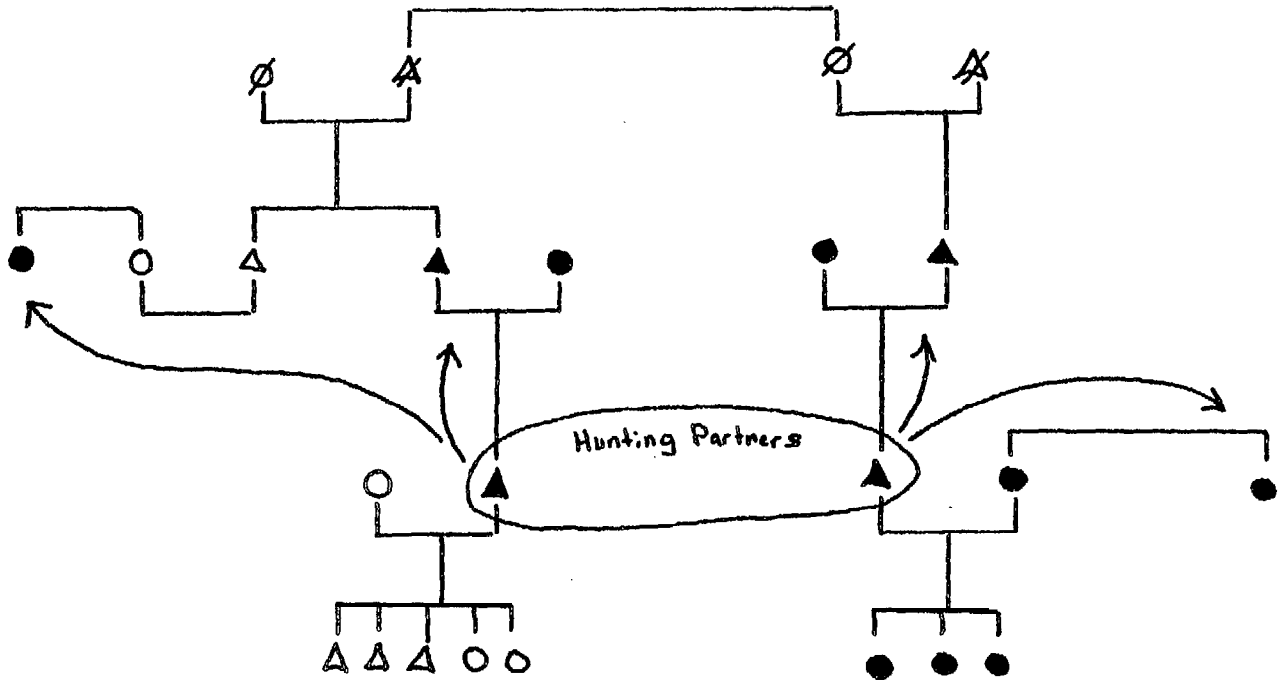


Figure 31. The distribution of waterfowl froma hunt. (Darkened persons receiving birds.)

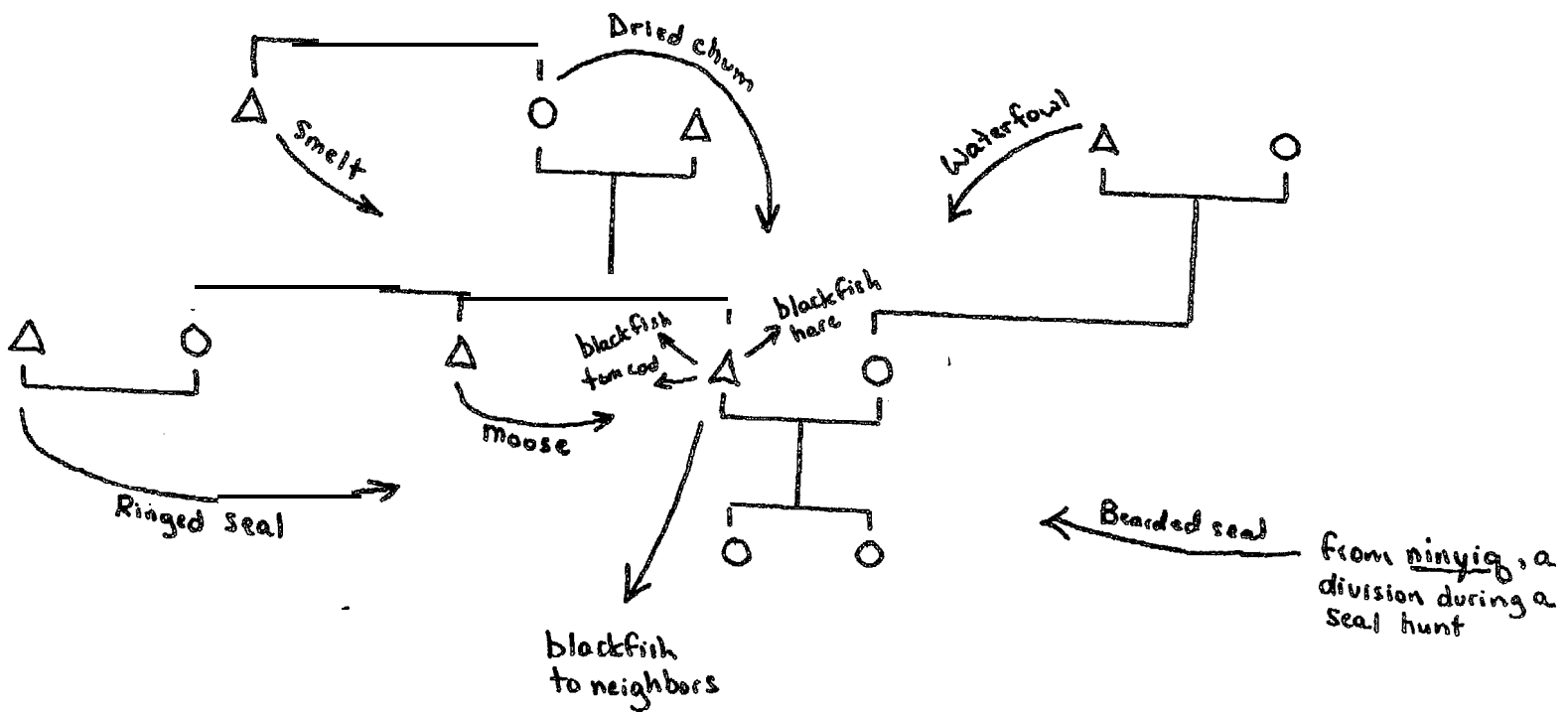


Figure 32. Examples of food distributions among a group of households

(chigiq, biyoqtuq, tufqaq); food exchanged or sold as economic goods (navolhotuq, tungyiaq); and food shared among members of one's close family. Finer distinctions among these cultural forms of food distribution and exchange must be left for future research.

The Giving of Food (Chigiq)

Giving food resources as an unsolicited bestowment or gift, termed chigiq, 'as a major social category Of food sharing activities" Chigiq means "to give" in a broad, generic sense. A number of food transfers between individuals were understood as representing this form of sharing. Probably all the food distributions mentioned in the cases above were examples of chigiq.

It was said that to chigiq food was common practice. Sharing food items this way reflected some cooperative spirit held between community members toward one another. Decreases in this form of sharing were perceived by some residents as an indicator of negative change within communities of the delta. The statement, "people don't share as much as they used to," was meant to characterize perceived deteriorations in the quality of social relationships within communities. The validity of this statement of course could not be determined. It was clear, however, that food was shared frequently, and sometimes in large quantities during 1981.

Apparently any type of food product, unprocessed or processed, could be shared. Chigiq meant that the food was unsolicited by the receiver and purportedly incurred no obligation by the receiver to reciprocate. Further, a giver normally did not keep account of the things shared this way. To some, however, receiving such food items did imply an obligation: one middle-aged woman stated that, when someone "chigiqed" her something, she always wanted to pay it back. Supporting this position, apparently indigent households disrupted the spirit of the practice of chigiq. One might stop "chigiqing" with persons who never worked although able and who, as nonproductive members of a community, lived off the proceeds of others. This suggests that between certain able-bodied individuals some balance was expected in the exchange of food products over time.

When asked to discuss principles underlying chigiq, a range of general statements were elicited, suggesting a framework to the pattern of giving. As general rules, these could be summarized into the following guidelines: 1. One shared with parents extensively. 2. One shared with elderly neighbors, ensuring that they "had the things you had." 3. One shared with relatives. 4. One shared with neighbors one was personaly close to, and got along well with. 5. One shared with neighbors one did not get along well with (to keep relationships from deteriorating further]. 6. One shared if one had "a lot of something that other people did not have a lot of." 7. One shared the year's first catch of a species. 8. One shared if there was a possibility that a food might be wasted if it were not shared. These statements

indicate that sharing at times was understood to symbolize a type and quality of social relationship between persons. Kinship relations defined appropriate networks along which food flowed. Close friendships were associated with food transfers. And food symbolized respect for the social position of the elderly. The statements also indicate that sharing was motivated by a desire to meet perceived needs of individuals who might not have access to certain types of food, such as the elderly who could not hunt or fish for themselves. While meeting needs, sharing also assuaged possible resentments among community members over disparities in personal possessions or good fortune.

Additional examples of food transfers observed during the summer of 1981 illustrate these general principles beyond the cases already presented. During early July, the chum runs peaked along the south pass of the Yukon River. Commercial fish processors were inundated with fish, fishermen waiting up to 3 hours to sell catches. Capacities were eventually reached, and buyers turned fishermen away who had fish to sell. Reportedly, this situation usually occurred at least once during a commercial season. Rather than waste the fish taken that period, many fishermen brought the unsold catches to the winter villages, and gave them away to individuals. While cutting salmon for drying, one family reported that the fish had come from a "cousin." Over 200 chum had been given, which were too many for the household to process, so they in turn gave salmon to a sister's family. A second household reported that salmon they were cutting had come from

"friends." This represented chigiq, the giving Of surplus to those with fewer resources, so as to avoid waste.

The sharing of large mammals, such as belukha, bearded seal, and moose, was similar. Because of their large size, the meat and oil might not be utilized by a single family. For instance, one hunter from Sheldon Point killed two belukhas during early summer, bringing the whales to the winter village for distribution. When not everything was used, the remaining meat and fat was taken to relatives and friends in Alakanuk and Emmonak, although this required expenditures of time and money, so that the belukha would not be wasted. In a like manner, a middle-aged man killed a belukha during the spring near Stebbins, bringing it to the beach. Anybody coming clown to the beach to help cut, or simply to watch, received some, the hunter deciding which portions. Afterwards, the man took portions he had retained around the village to the "elderly folk who were not fortunate enough to be able to hunt."

The Exchange of Food as an Economic Good

Traditionally within the cultures of the Yukon delta, food resources were exchanged as economic goods. Historical sources document large exchange networks for the trade of belukha oil, seal oil, caribou and reindeer skins, seal skins, woodware, dried salmon, whitefish, and furs between Yukon River communities during the nineteenth century (Wolfe, 1979). By and large, the volume of food products exchanged as economic goods has decreased within the region since about the 1920's. The last

major local trade involved dried fish for dogteams. Nevertheless, a small volume of food resources still were exchanged and sold as economic goods within the Yukon delta region during 1980-1981.

The terms for this type of food exchange were navolhotuq and tungyiaq. Navolhotuq referred to the exchange of one economic good for another, or what has been termed "barter." As explained by residents, if another person has an item one needs, one may offer to exchange something for it. If the goods are viewed as equivalent in value, the "swap" is transacted. Tungyiaq referred to the trade of goods involving some form of currency. If an item is sold for money, then this was tungyiaq.

Both forms of exchange occurred on the Yukon delta with local food resources. It is important to distinguish these traditional types of trade from the regulated "commercial" trade of food resources. "Commercial" trade of salmon and furs occurred between a licensed buyer and a resident fisherman or hunter for the purpose of export to outside markets. Navolhotuq and tungyiaq involved trade within local markets. The major difference then was the location and size of the market and in most, but not all cases, the nonlocal origin of the buyer. External market demand for products such as commercial salmon and furs potentially was larger than the region's capacities for sustained supply. Because demand potentially exceeds supply, the volume of commerical sales has been subject to regulation from sources external to the delta region to ensure that overproduction in the short term did not deplete

the resource base in the future. By contrast, demand for food products on internal, local markets historically has never been large enough to outstrip local supply. The relatively small population and ubiquitous range of' most food resources have limited local market demand for food and material products. The internal market was essentially self-regulating. It would be extremely unlikely that an internal market demand would develop for a local resource which would lead to short term over-production for local trade which threatened the resource base. Consequently, traditional barter and trade on local markets has not required outside regulation, as has the "commercial" sale of salmon and furs.

As with chigiq, potentially any food resource could be exchanged through navolhotuq and tungyiaq. In practice, commonly only a few products actually were exchanged on local markets in 1981. Seal oil was a major resource exchanged between coastal residents and main river residents. Seal oil was perceived by many main river Kwikpagmiut to be an essential component of their diet. Most exchange occurred after fall seal hunting. As one hunter described it, seal oil and munduq was "swapped" for "upriver things," such as wolf skins, wolverine skins, moose meat, and even groceries. If currency were involved, the value of seal oil increased with distance from the coast, prices ranging from $30 to $70 for 5 gallons of seal oil or the quantity derived from one whole carcass of a spotted or ringed seal. Moose meat was a major item that was traded downriver for seal oil.

The other major item exchanged was dried salmon, especially king salmon strips, or barrels of dried chum. Commonly, a small number of families during summer put up one or two extra barrels of dried salmon for exchange later on during the winter. For one reason or another, such as paid employments illness, or indigency, certain persons found themselves without adequate salmon supplies during winter. These individuals might buy these small surpluses offered on the local market for about $9 per pound in 1980. The substantial cost of processed salmon during winter compared with the costs to a person to process one's own supply during summer restricted this trade to a relatively low volume, nothing comparable to the sale of salmon as dog food in the 1920's and 1930's.

Periodically, other food items were offered for exchange as economic goods. Sheefish taken on the delta 'at Kotlik or Emmonak sometimes were exchanged at Stebbins during winter, bringing $4 to $5 apiece in 1980. Broad whitefish also were exchanged in limited quantities this way. Sometimes attempts to create a local market proved unsuccessful. During the spring of 1981 it was reported that an entrepreneur from Stebbins brought a boatload of herring to Kotlik for sale. No one would purchase them as economic goods, so he ended up giving them away (chigiq). Apparently, enough herring was received at Kotlik through traditional channels of sharing to defuse the development of a local herring market.

Regional Patterns of Distribution

Certain food resources were only produced within certain sectors of the Yukon delta region. Through chigiq, navolhotuq, and tungyiaq they flowed to other sectors, creating distribution patterns linking communities within the region. Herring was one such resource. Herring was not harvested within communities of the Yukon delta, but within two communities adjoining the delta--Stebbins and Scammon Bay. Strings of dried herring commonly were distributed along exchange networks throughout the communities of the Yukon delta region. When queried about dried herring hanging in their caches, households commonly replied that it had been sent to them by relatives or friends from Scammon Bay or Stebbins.

Smelt and lamprey were two other resources with restricted harvest ranges. Smelt primarily were harvested by households along the south pass of the Yukon for a few days in early summer. Lampreys were harvested along the main river from Mountain Village sometime after fall freezeup. Both resources flowed from their points of harvest to other sectors of the region. People on the lower Yukon stated they always knew when Mountain Villagers were catching lampreys, as lampreys began appearing in the households of coastal communities through exchange networks. Both smelt and lamprey were considered exceptionally rich in oil, such that a family could not consume large quantities. It made sense to give them away so many families possessed small quantities.

It has been mentioned previously that sheefish and broad whitefish caught on the main Yukon River commonly flowed along exchange networks to Stebbins, where these fish species were less abundant. Other food resources that frequently were traded within delta communities included blackfish, saffron cod, spring seal, moose, and when caught, caribou. A relatively smaller percentage of households made an effort to harvest these species. Thus, the catches of the few households often were distributed to others in the community. For these species, the food resources of a village at times were supplied by a few individuals.

As indicated earlier, probably the most widely distributed product with the largest volume was the oil of seals, moving from downriver to upriver communities. To document the sources of seal oil for one upriver community, the fifteen households interviewed at Mountain Village were asked where they received seal oil the previous year. This information is summarized in Table 13. As can be seen, all fifteen households procured seal oil in some manner. Nine households (60 percent) had members who successfully hunted seals, two along the main river, three at middle mouth, two at north mouth, one at Scammon Bay, and one at Hooper Bay. Nine households received seal oil procured by someone else, four from persons in Mountain Village, one from Emmonak, one from Kotlik, two from Scammon Bay, one from Chevak, and one from Hooper Bay. Seven transactions were described as 'gifts," four others described as "trade." The giver or trader was described as either "relative," "friend," or "neighbor."

Table 13

SOURCES OF SEAL OIL FOR

FIFTEEN MOUNTAIN VILLAGE HOUSEHOLDS

No.	Place Hunted	Place Received From	Relationship	Gift or Trade
1	--	Emmonak	Wife's Sister's Son	Gift
	--	Emmonak	Wife's Mother's Brothervs Daughter's Son	Trade
2	Hooper Bay	--	--	--
	--	Hooper Bay	Not determined	Trade
3	Kotlik	--	--	--
	--	Scammon Bay	Wifeqs Parallel Female Cousin	Gift
4	Main River	--	--	--
5	Middle Mouth	--	--	--
6	--	Mt. Village	Friends	Trade
7	Scammon Bay	--	--	--
8	Kotlik	--	--	--
9	--	Chevak	Friends	Gift
	--	Chevak	Friends	Trade
10	Middle Mouth	--	--	--
11	--	Mt. Village	"People in town"	Gift
12	--	Kotlik	Eluk, "second or third cousins"	Gift
	--	Mt. Village	Wife's Adopted SisterVs son	Gift
13	--	Mt. Village	"Neighbors"	Gift
14	Middle Mouth	--	--	--
	--	Scammon Bay	Not determined	--
15	Main River	--	--	--

The table illustrates the variety of channels through which seal oil was obtained at Mountain Village, reflecting the flexible options within local systems of distribution and exchange. Apparently some coastal residents served as regular suppliers of seal oil to relatives and friends upriver. One Sheldon Point man said he regularly brought seal oil upriver during fall to 'distant relatives" at St. Mary's, Pilot Station, and Russian Mission. Last year he distributed four spotted seals and several jars of seal oil among them as gifts brought to their homes (biyoktuq). Another Alakanuk man reported he always brought seal oil upriver while moose hunting in fall, which he gave to the persons he bought boat fuel from at St. Mary's. Regular patterns of distribution apparently were not conceived as representing institutionalized "exchange partnerships" as occurred in other parts of Alaska. The transfers of food occurred as one type of interaction among many between individuals or groups allied on the basis of kinship and friendship principles.

Sharing Within the Close Family

Probably the most common form of food giving on the delta was one for which no Yu'pik term could be elicited--the sharing of food among members of one's close family. In some sense, this did not seem to be a flow of goods at all. Close kinsmen frequently were perceived as holding in common food resources, frequently contained within a family food cache. Consequently, the food was not conceived as circulating

between separate units, but as being consumed within a single social unit.

As mentioned in Chapter 6, several closely related households might share a common cache. The kinship group frequently resembled a constellation of households composed of parents with married sons and daughters. The cache usually remained in the household of the parents. Members of such a network could take food from the cache when needed. Respondents indicated that this was done without the need for obtaining permission. In practice, sometimes notices of intent or requests were made, such as sending a young boy to the father's parent% house with the instruction, "go tell grandma we need some strips." The young boy might visit 'grandma" and receive instruction or assistance in procuring the food from the family's cache. All varieties of locally produced foods *were* shared in this manner.

In general, each household linked in this manner contributed food to the common cache. As was discussed in Chapter 3, the contributions frequently differed by age of the contributing member. As a general rule, sons contributed more seal and belukha to the family cache than elderly parents. Harvesting sea mammals required greater expenditures of strenuous labor and money than other food products. Elderly parents contributed more non-salmon fish species such as Bering cisco, sheefish, herring, saffron cod, blackfish, and broad whitefish. Non-salmon fish species required low level labor expenditures stretched over a long time frame and were less capital intensive. They were pursuits at

which an older household head could be successful. Women contributed labor in the preparation of food products for storage and consumption, as well as in gathering plants, eggs, and fish from jigging. Salmon and herring were products utilizing a combination of efforts.

Sharing Meals

Visits by a person to another's home on the Yukon delta typically were accompanied with the sharing of food. It was a common practice to offer a visitor tea or coffee in the first few minutes of a visit. If visitors stayed longer than an hour, or if the visit coincided with customary eating times, then they were commonly invited to share in a meal. Dried fish, seal oil, pilot crackers, and homemade bread would be produced and eaten. If others were eating or drinking in the home visited, it was seen as polite to join, and somewhat awkward to refuse. For instance, on one occasion a household head who was drinking tea remarked to a visitor, 'Won't you have some tea; I feel uncomfortable being the only one having tea here." Sharing food seemed to facilitate social interaction, representing a form of mutuality among partakers.

Visiting another% house at the winter village for fishcamp was a favorite and frequent pasttime of the people of the delta. Consequently, as most visits entailed sharing food, the amount of food distributed during visits was substantial. Large numbers of people might be fed on occasion. At times, an entire family from a fishcamp might be passing through a winter village, and stop at the home of a

relative or friend. If the travelers had been on the river for a while, then the hosts commonly prepared hot drinks and a full meal for the guests. In one home near the end of the commercial season, families traveling from two fishcamps coincidentally stopped at the same house to visit. The house was filled with adults, children, and infants, many sitting on the floor. Although visitors numbered more than twenty, food was provided to all.

When the number of people visiting was more than could fit in the kitchen area, people were accommodated by eating in shifts. One common practice was for the older men to eat first, followed in turn by the older women, and finally the young adults and children. If visitors arrived and no food was readily available, then individuals might be hurriedly sent to a cache, or to a local store, to procure food. Such trips to the store might result in substantial expenditures of money.

Visitors passing through on business frequently were fed and housed by relatives and friends. This especially happened if a meeting or ceremony (like a potlatch) was being held at the winter village, drawing people from the region. Sometimes lodging was provided for several days or weeks. A person might stay with a family while working at a seasonal construction project or at a fish processing facility in the village. If a visit were protracted, it was considered proper for arrangements to be made for the person to contribute food or income to the family to help lessen the cost of upkeep. Otherwise, the food given by a host to a visitor was viewed as a gift. Implicit in the

giving, however, was the knowledge that such hospitality would be reciprocated by the guest at his own households, should the hosts visit. In all probability, over time the gifts of food and lodging between visiting persons balanced out. If so, the gifts may be viewed as a type of balanced reciprocity over time.

Other Forms of Sharing

Other cultural categories of food sharing also existed on the delta. The precise referent to these types of giving and receiving must await further research, however. Some of these forms are briefly mentioned below.

Biyoqtuq was a form of giving like chigiq. Biyoqtuq referred to the bringing of food over to another person% house to be given. Like chigiq, it was done at the giver's initiative. Usually the giver brought the food himself. One generally did not biyoqtuq with close relatives, but with persons outside the sphere of relatives. It was said that no obligation was incurred about returning or reciprocating the gift. As an example, if a person caught a belukha, and brought it over to another's house as a gift, this was biyoqtuq.

Tufqaq was similar to biyoqtuq, except it referred to the process of inviting someone over to one's house to share food. Tufqaq implied the thought of wanting to have someone over to give: "I was thinking of

you when I made this meal." Chegeliq was said to refer to the actual sharing of the food at the person%! house, acting upon the invitation.

Ninyiq referred to the division of bearded seal and belukha among several cooperating hunters following the kill. Ninyiq more or less occurred according to a set of cultural rules, which varied somewhat by community. The hunters of some communities reportedly did not follow ninyiq conventions, unless perhaps an older, traditional hunter were present. If no rules were followed, then the person who killed the bearded seal or belukha took the portions he desired, leaving the remainder to be claimed informally among others present. To illustrate ninyiq rules, the traditional guidelines for dividing the meat of a bearded seal at Alakanuk was reported as the following: bedaq (first harpoon), back and rib section, the head, side flippers, the skin, and portions of the fat; gelutuq (second harpoon), intestines and chest section; igutuq (third and fourth harpoons), one leg with first rib to each hunter; kuiyuqtuq (oldest person), the tail bone and pelvis, or it may go to the third and fourth harpoonist. For dividing the blubber, the fat was laid out and a transverse cut made at the shoulder blades, and a second cut made laterally on the dorsal side, trisecting the fat. The left side piece was cut into strips, the width depending upon the number of people present. The first three strips went to the second, third, and fourth harpoonist; the remainder was given out by the first harpoonist to others present, perhaps by age. The first harpoonist received the rest. The heart, liver, and kidneys commonly were roasted and eaten on the beach. Cultural rules for dividing belukha were some-

what different. These conventions, when followed, ensured that certain participants in a seal or whale hunt received shares in the kill. Small seals were not subject to *ninyiq* rules.

Food was given out in a number of ceremonial and religious contexts as well. During winter potlatch ceremonies food and other items were commonly distributed among visitors. There existed several types of gift giving, such as gifts presented by one family to others attending the potlatch in commemoration of a son or daughter dancing in public for the first time; gifts commemorating the killing of a particular animal or the gathering of certain food products by a son or daughter (the first kill of a young person of each species was distributed to community members, the hunter receiving none of it); and gifts collected by members of one village and distributed from a pile by older ceremonial leaders to visitors from other villages. Potlatches occurred in reciprocal pairs between communities. During the study period, Stebbins and Kotlik engaged in regular potlatches, as did Emmonak and Alakaunk. People from other villages attended these potlatches as well. Gifts of food and other items commonly were given at other holiday festivities also, such as Easter and Christmas. One traditional Christmas custom was for close relatives to give gifts on a plate or bowl accompanied by *agutuq*, a food prepared in fish , oils, and berries. A messenger was sent to tell a family to come get the bowl; the receiver returned the plate to the giver with more *agutuq* and reciprocal gifts.

The Meaning of Food Sharing

The above discussion should illustrate the complexities involved in describing the movement of food products among individuals and families on the Yukon delta. Food was given and received within a number of culturally defined contexts. Some of these exchanges clearly appeared to be part of local economic activities of the region (navolhotuq, tungyiaq). Other exchanges more properly occurred as examples of "non-economic" activities. Certain categories of sharing symbolized the form and quality of social relationships. Food transfers commonly expressed close relationships between kinsmen and friends. Other gifts symbolized cultural values, such as respect for the elderly, hospitality toward travelers and proscriptions against wastage of food. Yet other food exchanges were part of a set of ceremonial and religious systems embued with complex cultural and personal meanings.

Clearly, in certain contexts food resources no longer were "just foods" or "just given and received." Food became a media for communication. Transfers of food between persons conveyed a number of symbolic messages, messages concerning personal sentiments structural relationships in the social order, and cultural complexes entailing beliefs and values. Such findings should not be surprising. Food procurement central to the biological survival of' a social group, commonly becomes infused with deep symbolic associations by humankind.

By implications, changes in the pattern of food resources probably affects more than economic systems of production and market exchange. Within the cultures of the Yukon delta, changes in resource procurement would be felt in social relationships as well. Seemingly? no enduring social ties or interaction existed without the giving and reception of food. One might predict that disruptions in the flow of local food resources might produce changes in the expression of social relationships, between young and old, parent and child, neighbors and communities. The flow of food between individuals was a primary symbol of close personal sentiments and social order within the community. Decreases in the giving and receiving of food might symbolize the antithesis.

CHAPTER 8

CULTURAL CONCEPTS OF RESOURCE UTILIZATION

The patterns of resource utilization within the Yukon delta region during the early 1980's had been shaped by distinctive cultural rules concerning an individual's right to fish, hunt, trap, and collect within particular geographic areas. These cultural concepts pertained to a person's right of access to particular resource areas, the right to harvest and use the resources of that area, and the right to exercise control over the area and its products. It is important to recognize that at the time of the study there existed at least two bodies of rules pertaining to use rights--those rules constituted by legislative, judicial, administrative, and other governmental agencies, and those rules developed by the residents of the Yukon delta themselves. The first set of rules, frequently created through formal public procedures for the most part external to the delta region, were recognized as valid legal regulations by representatives of the Western cultural institutions from which the rules derived. The second set of rules were developed by the fishermen and hunters within the Yukon delta region through a less formal, consensual process, probably over a relatively longer period of time. By and large they were recognized as valid cultural proscriptions and prescriptions by the region's

residents, although not formally recognized as such by formal legal authorities.

This chapter describes some of the endogenous cultural ideas concerning use rights over land and sea resources within the Yukon delta region. These cultural rules guided an individual's conduct in fishing, hunting, trapping, and collecting activities. In several significant ways the rules differed from the exogenous cultural ideas codified within traditional Western jurisprudence. Specifically, it is argued in this chapter that access to, use of, and control over resources of the land and sea traditionally were not conceptualized by the Kwikpagmiut in terms of real property and exclusive ownership. The notion that an individual or corporate group could own a resource area (ownership in the sense of holding exclusive rights to possess, enjoy, and dispose of it as real property) was not a traditional cultural concept within the region, and still was not a common one in the early 1980's. By contrast, Kwikpagmiut cultural concepts generally allocated partial use rights within an area to particular social categories of persons. The use rights were allocated along several criteria, including prior use, kinship, and regional affiliation. The cultural rules differed among resources, such that access to salmon fishing areas followed principles different from those guiding access to moose hunting areas. Similarly, the cultural rules differed by locale, so that use of resources close to an occupied settlement differed from use of resources distant from a population center.

The discussion that follows should not be considered an explication of Eskimo jurisprudence concerning land and sea resource use in the Kwikpagmiut region. Such a treatise would require substantially more research and information. Instead, it is only a partial description of patterns of resource use observed in the 1980's in the Yukon delta region. From these observed use patterns, and through discussions with residents certain general cultural rules or principles were extrapolated. These cultural rules should be regarded as tentative, and form a basis for subsequent inquiry. Further research should provide a more complete description of actual use patterns, an elicitation of Yu'pik terminology reflecting the abstract cultural principles, and a corpus of actual cases whereby conflicts in resource use were dealt with by the social groups utilizing the principles of ethnojurisprudence. Further research also might examine the interface of indigenous and exogenous legal systems concerning resource use.

Spatial Arrangements of Harvest Efforts

All societies must deal with the issue of potential conflict among alternative users of a finite natural resource. As resource areas are not unlimited within geographic space, the rights concerning access to these resource areas must be defined so that resources are allocated in some manner among members of the social group. A set of consensual conventions specifying rights of access have been developed within the Yukon delta region by the Kwikpagmiut. These rules pertained to an

individual's right to fish, hunt, trap, and collect within particular areas.

As with most cultural rules guiding human action, these conventions were not codified within an explicit set of written law. Nor were they frequently verbalized by fishermen and hunters. Nevertheless, at a tacit, implicit level, the cultural rules were more or less understood by the residents of the Yukon delta. They regularly guided individual conduct in fishing, hunting, and other daily activities by the force of custom and a variety of social sanctions. When followed, the rules helped to reduce social conflict which might arise from competition among group members. They also served an ecologically adaptive function by regulating unlimited access to harvest areas that might irreparably delete a renewable resource.

Before the rules are discussed, the spatial arrangements of harvest efforts, the resultant product of these rules, are described below. The mapping of fishing and hunting activities of residents of the Yukon delta region during the period June 1980 through May 1981 (Chapter 3) revealed district clustering of harvest efforts for certain species. In practice, people tended to locate summer fishcamps in areas close to others from their winter village, and distinct from areas occupied by persons from other villages (see discussion in Chapter 3). Overlap of fishcamps occurred at the boundaries of these areas, especially at the head of the passes and Aproka Pass. As fishermen tended to drift or

place set nets close to fishcamps, fishing effort in general occurred within "village use areas."

Similarly, hunting for seals and belukha tended in practice to occur within coastal areas extending out from winter villages. These sealing areas utilized by members of a particular village overlapped considerably at their boundaries, especially at south mouth where three winter villages are found in close proximity. Indeed, the area utilized by Sheldon Point residents seemed to fall within the boundaries of the area hunted by Alakanuk. In addition, Mountain Village residents frequently traveled downriver in the late fall to hunt seals within all coastal areas.

Net placement sites for non-salmon species, generally harvested from winter through spring, tended to cluster closely around the winter village. An exception was set netting and hooking sites for whitefish and pike on tundra streams south of Kwikluak Pass, especially along the Kipniak and Akulurak Rivers. These areas were shared by residents of several villages, including people from Scammon Bay, Hooper Bay, and Chevak. Set net placement sites for non-salmon fish species in general were not identified with a particular user. However, they occasionally were when a person had used a stream or lake location for long periods of time. This especially might happen with regards to blackfish trap locations.

As briefly discussed in Chapter 3, salmon set net placement sites, and salmon drifting areas next to a fishcamp tended to be used primarily by the members of the nearby fishcamp. Some salmon fishing sites not near a fishcamp, especially sites within eddies, also were identified with particular users. It was considered improper for a fisherman to set a net in, or drift close by, an eddy or stretch of river known to be regularly used by another individual. Use of the area properly occurred upon invitation or granted request by the individuals currently using the eddy or drifting site. Unoccupied salmon harvest sites tended to be open for common use on a 'first-come" basis, at the beginning of each fishing period. These areas frequently were stretches of river far from winter settlements, such as the middle passes and heads of passes, and along the coastal channels.

Hunters frequently traveled long distances to hunt and trap land mammals. Hunters from coastal villages regularly traveled upriver in September to hunt moose and caribou in the sloughs and mountainous regions near Pilot Station and Russian Mission. Similarly, hunters frequently fanned out from their villages in winter by snowmachine, covering large domains in search of fox, mink, otter and beaver. Detailed information on trapping locations was not gathered in this study. However, from general information it appeared as if trapping areas resembled sealing areas with hunters from a particular village using certain preferential areas, overlap occurring at the boundaries of the regions. Within these areas some trappers, especially older residents, ran traplines year after year. Such traplines in general

were known and respected by other trappers, although complaints about tampering were heard occasionally. Apparently most hunters and trappers of' fur bearers did not establish regular traplines, preferring to utilize a larger, more variable area for fur bearers.

Waterfowl and berries were two other resources harvested over large areas. During fall, families frequently traveled long distances in procurement of salmonberries, blueberries, blackberries and raspberries, which during some years grew in limited areas in the region. The fall and spring hunting of waterfowl similarly might take hunters long distances.

These spatial regularities reveal a complex patterning to resource harvest efforts in the Kwikpagmiut region. For certain resources, "use areas" seem to have developed associated with particular villages (fishcamp regions, sealing and belukha hunting areas, areas for taking non-salmon fish species, and perhaps fur harvest areas). For other resources, there appears to have developed a region-wide use pattern (moose, waterfowl, berries, and certain fish species like pike and broad whitefish). Within the use areas associated with a village, specific sites might be associated with particular families for harvesting certain species (especially salmon set net sites and drift net sites, trapping lines, and perhaps blackfish trap areas). However, for other species, there appeared to occur no individually identified use sites (non-salmon fish species, seals, birds, plants). Areas distant from a winter village frequently were used by hunters from a

variety of winter villages (especially the Black River and Kwikluak Mountain area).

Principles Regulating Land Use Patterns

At first glance, clustered activities might be interpreted as representing the "territory" of a village or a family, or perhaps the land "owned" as 'property' by a village or family. This would be a mistaken interpretation. Both territorial and property concepts were inappropriate for understanding geographic regularities in resource use. Most Kwikpagmiut themselves were insistent about this. When queried directly, Kwikpagmiut by and large denied that winter villages or other groups of people possessed territories, in the sense that they held sovereignty or jurisdiction over particular fishing or hunting areas, granting or denying access to the resources of that region. They also denied that villages or groups of people "owned" fishing or hunting areas as property. That is to say, in general the Kwikpagmiut would not endorse the notion that individuals or groups held exclusive rights to possess, enjoy, and dispose of an extent of land or water within the Kwikpagmiut region, in exclusion of other Kwikpagmiut.

It was significant that the concepts of 'territory' and "property" were utilized by Kwikpagmiut in certain contexts. Most commonly, these concepts were utilized when discussing the conveyance of land to the regional and village corporations following the specifications of the Alaska Native Claims Settlement Act of 1971. The concepts also emerged

when discussing native land allotments under Bureau of Indian Affairs regulations? the limited entry permits for commercial salmon fishing of the State Limited Entry Commission, and the rights to oil development on delta lands and the offshore continental shelf. In these contexts, the land, water, and resources were discussed as if they might be divided into estates, the right of use, control, and disposition belonging to a specified group. And as can be expected, delta residents demonstrated different degrees of sophistication in their handling of these legal issues. Thus, in contexts where the Kwikpagmiut interfaced with Western legal institutions the ideas of "territory" and "property" were utilized for conceptualizing land and sea resources.

Nevertheless, when discussing the day-to-day fishing and hunting activities of Kwikpagmiut individuals and groups, terms like "property," "territory," "ownership," and "jurisdiction" were rarely conveyed, and frequently expressly refuted. Apparently in the ordering of fishing and hunting activities among themselves, another set of principles or rules was utilized. As stated earlier, these concepts were not codified in any manifest form. If they were reified as abstract rules, the concepts might coalesce into five general principles: the principles of "participatory use," "geographic affiliation," "deference to first-users," 'kinship affiliation," and "optimization."

The Principle of Participatory Use

"Participatory use" of an area for fishing, hunting, trapping, or collecting refers to two ideas. First, areas and their resources can be "used" by individuals or groups, but not owned. "Usufruct" approximates this idea, the right to use or enjoy the products of an estate not belonging to oneself. However, from the Kwikpagmiut standpoint no one else owns an area either. According to this traditional perspective, there are rightful occupants and users of a region of land and water, but no rightful owners.

Second, 'participatory" alludes to the idea that an occupant rarely hunted or fished in an area alone. Generally one "participated" with others in the pattern of life activities of a region. The associates who mutually shared an area included other people as well as animals, fish, birds, plants, and for some Kwikpagmiut, certain intangible senscient beings and forces. Each living entity might be a rightful occupant of a region, with some entitlement to engage in its daily round of occupations. Properly, a fisherman or hunter was mindful of, and showed cautious respect toward, the others with whom he participated in daily pursuits.

The Principle of Geographic Affiliation

The determination of the persons who could claim rightful occupancy and use of an area was determined by at least three other principles. The

first was a 'principle of geographic affiliation." According to this principle, a person held a right of access to any region with which he could demonstrate a perduring social identity. The geographic naming conventions of Eskimo social groupings embodied this principle. As previously mentioned in Chapter 2, the people living within a certain geographic region typically derived a social identity from that area. A Yu'pik root designating some natural feature of a region, such as a river, lake, or type of land, was combined with the affix, -miut, 'people of," to symbolize the social identification of a group of people with the land of occupancy. As an example, Kwikpagmiut referred to the "people of Kwikpak," that is, the "people of the big river." Magagmiut, the traditional "tribal" group directly south of the Kwikpagmiut, meant "people of the tundra flats."

In some respects, regional designations were similar to Western political designations like "American" and "Canadian." By claiming to be an "American," one makes claim to certain rights and privileges held by other 'Americans," but not necessarily by citizens of other political states. One right is a right to a "speedy trial." For the Kwikpagmiut, a central right which could be claimed was access to resources within one's region of geographic affiliation. However, the social identification with the Yukon River did not provide the right of "ownership" to the Kiwkpagmiut, any more than an "American" can claim to own "America."

Further, like the concept of "American," a person acquired geographic affiliations at birth. By being born at a particular place, and by dwelling there, one became identified with it. Consequently, "geographic affiliations" were frequently closely associated with 'kinship affiliations," discussed in Chapters 5 and 6. At birth, one received at least two social identities: one with a set of kinsmen ("family," elakitraet), the other with a geographic region within which the kinship group usually resided. The two were not synonymous, however, as one could be a Kwikpagmiut, yet maintain kinship affiliations with people from another region, such as the Hooper Bay area.

Terms for geographic affiliation occurred at several levels of contrast. The higher order contrasts referred to large "regional groups," called "tribes" in the literature. Below that, social identification could be established with smaller areas within the region, such as Kwikluagmiut, referring to persons living near Kwikluak Pass (the "people of the funny little river"), or Kipniagmiut, those living near the Kipniak River. Similarly, the people of each subarea could be identified with yet smaller subregions, like Alakanagmiut and Niliragmiut, which referred to winter villages and seasonal camp locations. There seemed to be no limit as to the size of the subregion or group which could be linked socially. During 1980-1981, the Kwigamiut referred to a solitary person living at the site of Kwiguk.

The principle of geographic affiliation provided a flexible system which could be used to justify access to and use of resources within a

Relatively wide area. At its greatest extent, the principle opened up for use the entire region from Russian Mission to the coast to the residents of all Kwikpagmiut villages. It was this principle which allowed for Kwikpagmiut to travel long distances within the region to fish and hunt. During 1980-1981, harvest patterns for moose, seal, waterfowl and berries were guided in part by this principle. Hunters from lower Yukon river communities traveled upriver in September to hunt moose around Russian Mission and Pilot Station, but not above Holy Cross. Holy Cross lay at the boundary of the region, indeed, at Yuit boundaries, as this marked the start of Dene' settlements (Athapaskan Indians). Reciprocally, Mountain Village hunters commonly traveled downriver in August to harvest seals along the coast. The hunting of waterfowl occasionally led persons near to distant communities, as did the gathering of berries. There seemed to exist no overt resentment about the practice of residents of one village buntings fishing, or collecting close to another village. When queried, most people stated that they did not mind. A reason frequently provided was that these people needed food for their families.

The Principle of Deference to First-Users

As can be seen, the principle of geographic affiliation potentially opened up the resources of the entire lower Yukon region for use by all Kwikpagmiut. How then were harvest practices managed so as to avoid conflicts among alternative users of limited resource areas? The principle of 'deference to first-users" was one mechanism for

allocating delimited areas among users. According to this principle, a person or group of persons using an area first were viewed by others as holding priority over its resources. This meant that persons using an area first (in temporal sense) were deferred to by persons who came subsequently to use an area. It was considered polite, or socially correct, not to intrude upon an area occupied or being utilized before one's arrival.

The principle of deference is most easily explained through some case examples illustrating the principle in use.

Case 1. Early in the 1980 fishing season a young fisherman arrived at Emmonak extremely excited and pleased. He had located an ideal site for his set net, an eddy where the current played the net perfectly. When he described the location of this eddy in response to questioning by other fishermen, he was informed that the site had been used last season by another person living in Emmonak. The young fisherman was crestfallen. There had been no red buoys yet placed in the eddy, or nets piled along the shore, so he had thought the site was 'unoccupied.' He left greatly disappointed, in search once again for a set net site.

This case illustrates two things. First, that properly a person deferred to another who could demonstrate prior use to a fishing site. There seemed to be no question in the young person's mind of his proper recourse. Second, a set net site could be "occupied" even without

tangible evidence of an occupant. Simply the knowledge held within the community that on previous occasions a person had used a place was sufficient. proof of occupancy and use.

Case 2. A woman from Mountain Village was picking salmon berries with her brother on a large hillside several miles from the winter village. The hill was a traditional berry picking area for the Azochoragmiut (people of Mountain Village), as evidenced by several tracks which wind along the hill's top, worn into the soft tundra from generations of use. As the woman slowly circled the hill gathering berries, she came into sight of two women of another berry group from Mountain Village, who had been circling the hill from the opposite side. Although she had spotted the second group, they as yet had not seen her. "Oh," she exclaimed softly, 'we had better turn back. Those ladies might not come this way to pick if they see us here." She quickly moved back out of sight on the opposite side of the hill.

In this case, like the first, a potential user of a resource area deferred to another user who was perceived as having been at the area first. In this instance, 'first' referred to being in a location at the moment the second user arrived. If the berry picking group had not been present, the opposite side of the hill would have been open for the woman's use. Interestingly, the reason provided for deferring to the first group of pickers was that they might do the same. The result of this principle mutually applied is that two hunting or gathering parties attempt to avoid contact with one another in a general resource

area. This regularly occurred with fall seal hunting groups. If a person hunting seals along the coast spotted another boat or cluster of boats hunting together in the distance, a typical recourse was to change direction away from the other hunting group. If a boat approached a cluster of boats, then another set of principles would have to be invoked to integrate the newcomer into the hunting party (such as WinShip affiliation," or the principle of ninyiq, the customary rule of dividing sea mammals taken within a hunting group).

The conventions for claiming driftwood is a final illustration of the principle of deference to first users. During spring breakup, drift-wood frequently was deposited along the banks of the rivers and sloughs of the delta. The driftwood was collected for firewood and building material by the residents of the lower river who had no easy access to forests. One convention held that a person who found a cluster of driftwood along the river could mark it with a vertical stick, a pile of logs, or a short piece of rope, thereby claiming the right to return at some later time to cut and transport the wood to the winter village. The stick or rope announced to others that someone had already been there and discovered the wood. It was proper that the wood be left for that first person to use. The result of this practice was somewhat novel. Driftwood logs for miles around a winter village would display small, seemingly non-utilitarian pieces of rope, inexplicable signs of human activity for someone unaware of their symbolic message.

The Principle of Kinship Affiliation

Because of first use primacy, areas like trapping lines, eddies, and drifting locations commonly became identified with particular users. In actuality, the area was identified with persons and their close kindred. It was considered appropriate in Kwikpagmiut culture that close kin relations share resources, such as a common food supply, dwellings, and fishing equipment. For the closest kin relations like parent-child or husband-wife, mutual sharing of resources might occur without the obligation of asking permission. For more distant relations, sharing could be an acceptable practice, but only if agreed upon by the two parties. To be correct, a distant kin relation did not presume upon another person for resources without first gaining permission. Such requests were said to be usually granted.

Kinship affiliation allowed one mechanism whereby access could be gained to a resource area customarily used by another. Because of this principle, persons fishing and hunting *together* within a particular area commonly were linked by some kinship tie. The principle commonly influenced upriver seal hunters coming down to the coast, and downriver moose hunters traveling up. Frequently an individual would choose an area to hunt in which he had a relative. At times, the hunter would reside at that person's house or camp, making it the base for operations. The kin relation might accompany the hunter in his harvest efforts. Some persons avoided hunting in areas where he perceived no close relations. That is, one avoided hunting near strangers or even

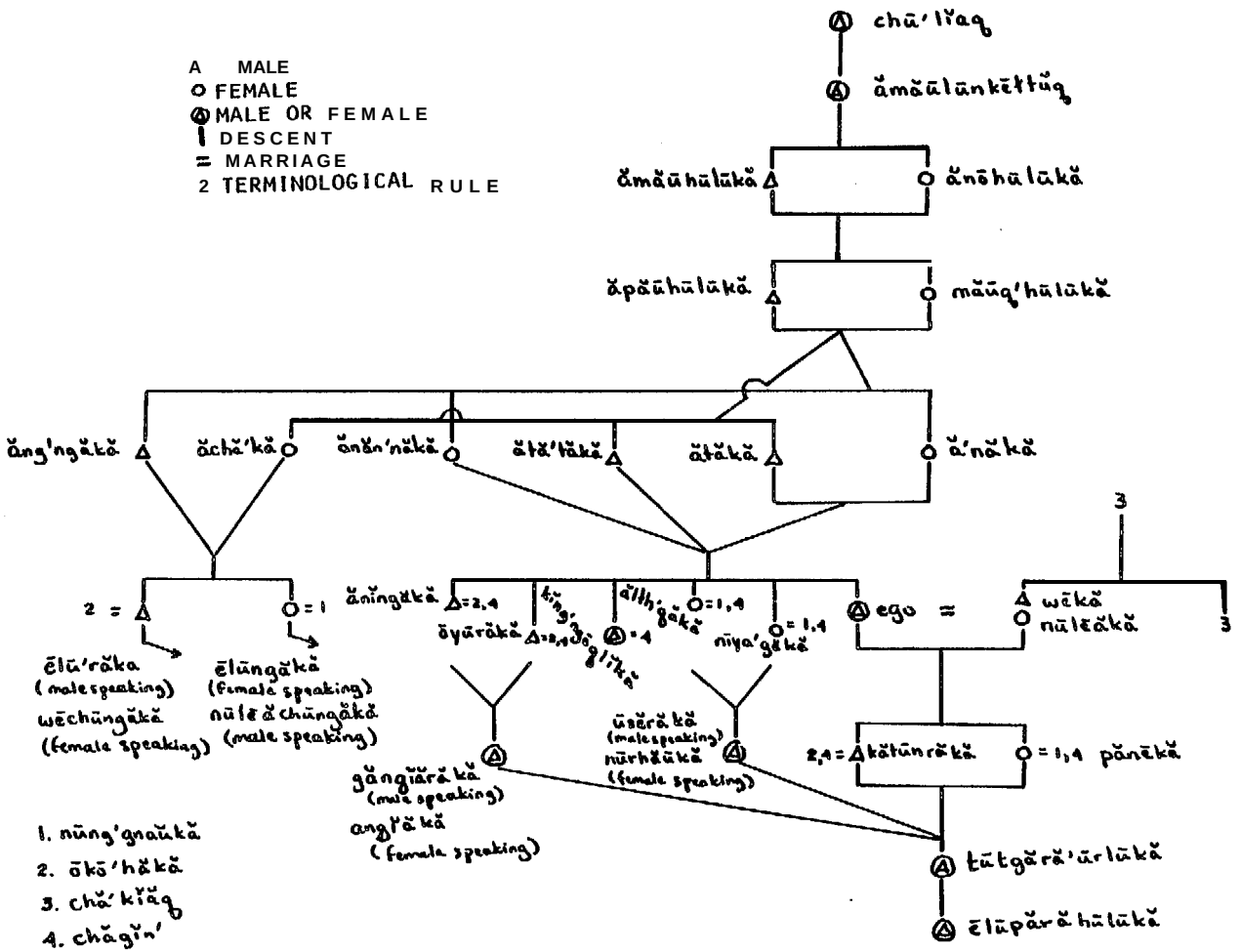


Figure 20. Yukon delta kinship terminology, "southern system" (Alakanuk, Emmonak, Sheldon Point, Mountain Village)

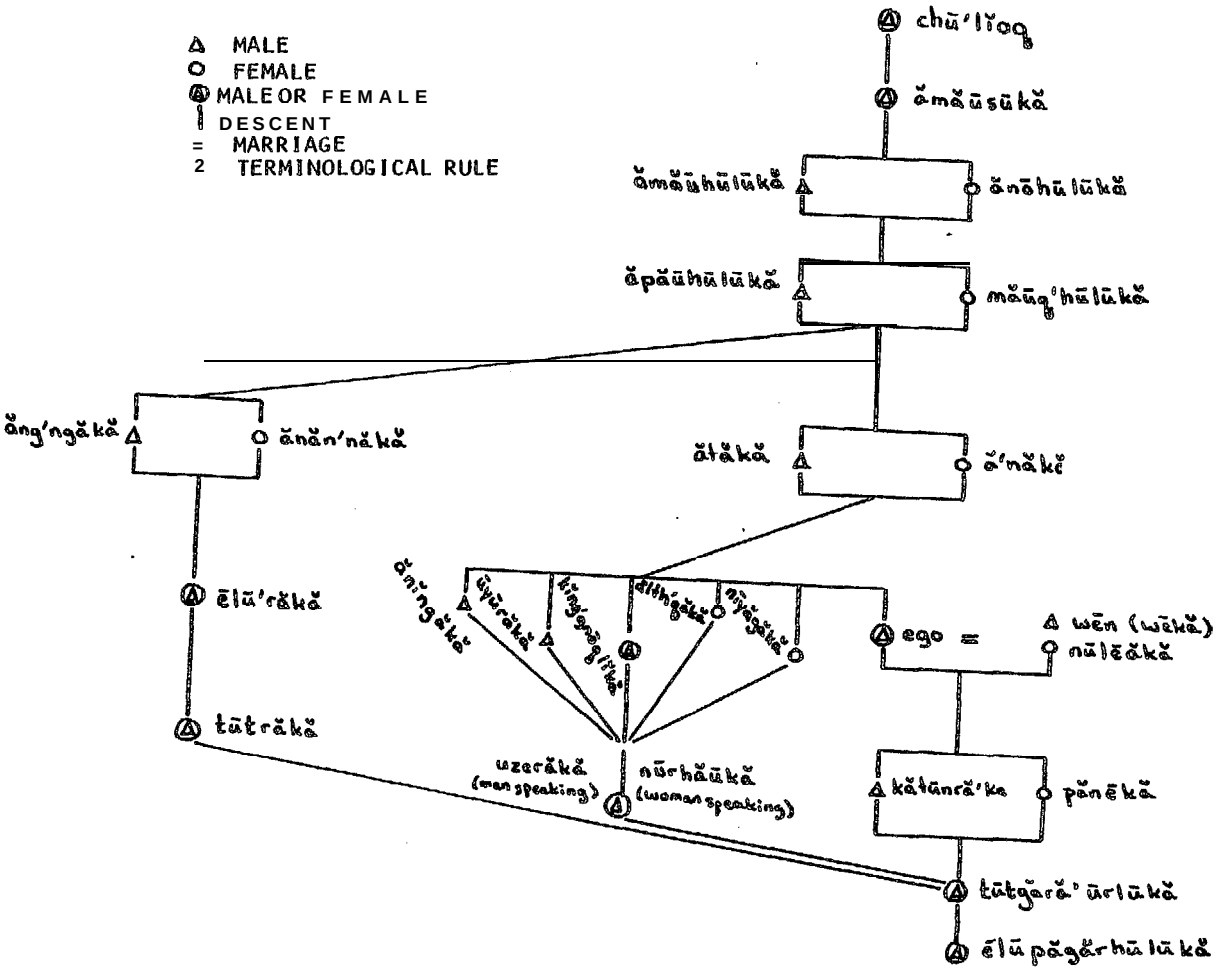


Figure 21. Yukon delta kinship terminology, "northern system" (Kotlik, Stebbins)

acquaintances. Purportedly, one could not be guaranteed a favorable response from such persons. Kinship ties could establish the basis for that trust.

In addition to establishing trust between mutual users of an area, the outsider gained the expertise of the resident to whom he attached himself. Hunters generally knew their home base well, and could share this knowledge and experience with novice hunters. There seemed to be a tendency for hunters who harvested resources in distant areas to choose to hunt in the region of their birth, or the areas of their parents' birth. For example, a hunter near Hamilton, upon questioning, was found to have had a father from that vicinity who had taken his son to his home base to hunt. The use of kinship principles to gain access to an area had double rewards for a hunter. It provided a sense of security knowing one hunted with a 'close" and "trustworthy" individual. And it offered expert assistance in the procurement of fcod resources.

Optimization

The final prinicple regulating land and resource use was simply "optimization" of one's effort and material investment. Other things being equal, of two resource areas, a hunter usually chose to harvest the least expensive for one's returns. This drive toward efficiency meant that hunters commonly chose to harvest resource areas close to their homes over resource areas farther away. Travel represented costs in

time, effort, and fuel. Most hunters strove to minimize these costs per return if possible.

This principle probably accounts for the clustering of certain activities near the winter villages. For fairly ubiquitous food species like blackfish and sheefish alternative resource areas existed. The areas closer to home were chosen over those more distant when one had the option. It is interesting to note what occurred in areas far from occupied settlements offering uncommon resources. Pike at Kusilvak Mountains and caribou and moose in the Andreafsky Mountains represented such resources. The dearth of permanent residents mitigated against first use tenures. Being at the margins of' a regional group diluted the claims of regional affiliation. Such areas were generally open to all users. Thus people from several communities and even different regional groups could be found harvesting resources in these areas.

The five principles outlined above are sufficient to explain the geographic trends in resource use displayed by the Kwikpagmiut during 1980-1981. Harvest efforts grouped about the winter village, such as non-salmon fish harvests and fall scalings probably resulted from a desire to minimize costs relative to returns. The mutual avoidance of unrelated users in the same area tended to keep these spheres of' activities somewhat separated. Access to areas with scarcer resources could be justified with the concepts of' regional and kinship affiliation. However, deference was given to prior users of a resource area. Apparently, in this manner participatory use by members of a regional

group traditionally was regulated without relying on the concepts of ownership and property.

CHAPTER 9

OIL DEVELOPMENT IN NORTON BASIN AND THE YUKON DELTA ECONOMY: IDENTIFICATION OF PROSPECTIVE ISSUES

A major purpose of this study was to develop a baseline description of the economy of six Yukon delta communities. As outlined in Chapter 1, this information was considered to be essential as input to policy decisions concerning the possibility of' oil development in Norton Basin. Offshore exploration and development of oil in Norton Sound is seen to hold the potential for impacts on the people on the Yukon delta; yet without even baseline information concerning the economy of the Yukon delta, these impacts cannot be assessed. This study was conceptualized to begin to fill the 'information vacuum" surrounding the Yukon delta residents.

This study was not conceived to be an impact analysis, but a descriptive account of the regional economy as it existed currently. However, the study's design included "the identification of key Yukon delta issues regarding land, sea, and resource allocation, perceived and actual conflicts between existing resource users and/or allocations and perceived real or potential disruptions to the existing subsistence systems of the Yukon delta." That is, the design included the

identification of possible conflicts arising within the Yukon delta region as a result of petroleum exploration and development.

In response to this study objective, this chapter identifies some of the potential issues surrounding petroleum development in Norton Basin. These issues emerged as significant primarily from discussions with residents of the Yukon delta region during the summer of 1981. It was found that oil development was a topic of considerable concern to the Yukon delta population. The following represents a summary of the primary concerns voiced by residents of the delta.

Percieved Threats to the Regional Economy

As has been illustrated in previous chapters, the economy of the " communities of the Yukon delta comprised a flexible pattern of fishing, hunting, and marketing activities based upon the utilization of local resources from the land and sea. The economy, and consequently the society and culture of the region, has evidenced great vitality and historic continuity to a large extent because of the enduring stability of the region's resource base. Except for caribou, historically there have been no serious or permanent reductions in the region's fish and game resources. Further, favorable political climates and markets have enabled the region% population to successfully utilize their rich ecology. Elsewhere it has been argued that the mixed, diversified economy of fishing, hunting, and marketing activities on the Yukon delta likely should continue, barring three potential threats: disruption of the base of natural resources, inflationary equipment costs outstripping

earned monetary incomes, and easy access to state and federal income assistance (Wolfe, 1979:266-270). Petroleum development portends the reality of the first two threats, through the potentialities of environmental degradation and disruption of species migration patterns, and increased inflation rates.

Environmental Degradation

The degradation of the region's ecology of animals and plants over the short or long term could disrupt the region% base of economic resources and aspects of the regional economy and culture. Of all the issues raised by the Yukon delta residents, this was primary. The people of the Yukon delta recognized a direct causal relationship between resource levels and their society and culture. They also expressed that the destruction of the fish and game resources could mean the destruction of themselves as a people. One Emmonak resident put it simply and to the point: 'If fishing and hunting disappears, so will these people."

The primary historic resources of the region derived from the ocean and waters of the coast--salmon, herring, seals, belukha, sheefish, Bering cisco, broad whitefish. Degradation of these waters might diminish the quantity and quality of these essential resources. Damage to the environment was recognized by residents in several aspects of oil development: increased boat traffic in coastal and riverine waters causing increased noise and pollution from diesel discharges; scarring of the landscape with the construction of rigs and support facilities; water and land pollution due to drilling effluent; water and land

pollution due to oil seepage or spills; and barriers to migration routes following construction of islands or transportation corridors. All of these represented to residents significant threats to the region's economic base.

The Kwiwkpagmiut and Tapraqmiut understood their relationship with the land and sea and its resources to be a sensitively balanced system. Unusual conditions within this balanced system, such as atypical ice conditions, weather changes, or topographic modifications, were known to be frequently followed by reductions in fishing and hunting outputs. As hunters and fishermen who relied on the products of the sea and land for survival, any unusual alteration in the environmental balance was viewed with extreme apprehension and frequently fear. It is little wonder that the overwhelming opinion among the Yukon delta people was to avoid disrupting the perceived sensitive balance in their relationship with their natural surroundings.

It was percieved that if the region's resource base were disrupted, there existed no other viable economic alternatives for the region's people. Salmon and herring were the region's only renewable and marketable resource. Without the sale of salmon and herring, the main flow of monetary income into the region would be cut.

The major sources of food in the region derived from local fish and game resources, as demonstrated in Chapters 3 and 4. It was percieved that a failure of these food products would change a predominantly

self-sufficient people into a society dependent upon state and federal subsidies, welfare, and food stamps.

The fabric of social life was woven about the seasonal round of fishing, hunting, and marketing activities, as illustrated in Chapters 5 and 6. It was expressed that if families were bereft of these self-sustaining and meaningful economic pursuits, the organization of family and community might be disrupted.

The Yukon delta people perceived these relationships to be true. Given the percieved potential risks to their entire way of life, it is little wonder that, of the 88 households systematically interviewed from the six Yukon delta communities during May through August 1981, 86 stated their opposition to petroleum development in Norton Sound.

Increased Inflation Rates

It has been argued here and elsewhere (Wolfe, 1979) that the regional economy on the Yukon delta was viable because the "subsistence" component (fishing, hunting, and trapping for local use) and the "commercial" component (production for sale on external markets) were interdependent and mutually supportive. The cash from product sales (salmon, herring, furs) and wage work provided households with the cash capital which supported fishing and hunting for local consumption and exchange. Because of the inherent limits set on commercial earnings by the finite potentials of the Yukon River salmon resources and the differential access to limited entry permits, most households could never be

supported solely by commercial fishing income. Consequently, most families invested a substantial part of their cash income into equipment to enable them to fish and hunt for personal consumption and local exchange.

One percieved threat to this mutually supportive "mixed" economy is inflationary equipment costs. If the costs of maintaining and operating production capital (such as boats, motors, snowmachines, gill nets, gasoline, repair costs) exceeds income from commercial fish sales and wage work, then regional production would be in serious jeopardy. The household "firm" could no longer profitably afford to harvest local resources for sale and family use.

Up to this point', inflation rates have not outstripped rises in income on the Yukon delta. However, it was percieved by some residents that oil development might create such a damaging inflationary period. Petroleum firms might compete with local buyers for the goods and services existing within the region. Inflationary prices have been predicted as following this competition (Ellanna, 1980). If store prices jumped substantially, residents on relatively fixed monetary incomes might be unable to afford the material products to successfully harvest local resources. The result might be a drop in commercial and subsistence output within the region.

Inadequate Knowledge and Technology

The perceived threats to the regional economy were increased by what was perceived by Yukon delta residents as an inadequate knowledge base and inadequate technology of petroleum developers. By and large, the Kwikpagmiut and Tapraqmiut believed that outsiders do not have an adequate understanding of the region's ecology to enable them to explore and develop oil resources safely. Nor was it thought that petroleum developers possessed the technical expertise to explore and develop oil resources safely. The Kwikpagmiut expressed concern especially about ice conditions, flooding, ocean currents, and effective cleanup.

Ice Conditions

The Kwikpagmiut along the coast of Bering Sea and Norton Sound reported that frequently the sea ice pack fractured and built up into large ice formations, sometimes 50 to 60 feet high. These mountains of ice reportedly were created and moved about by the extreme forces of tides and winds. The mechanisms creating these conditions were not known precisely by the Kwikpagmiut, but the potentially destructive consequences were. Grave doubts were expressed that a drilling or pumping structure could withstand the force of these moving ice formations. By and large, residents were unconvinced that a technology existed to deal with these ice conditions. Some respondents argued that a drilling platform should be placed inactivated within Norton Sound for

several years to assess the potential damage to it by ice before actual drilling commenced.

Fall Floods

The Kwikpagmiut expressed concern about the potential destructiveness of an oil spill during a period of high fall flooding. Reportedly, the Yukon delta periodically was subjected to extensive flooding during fall due to a combination of high tides and winds. Most lowlying tundra areas at this time were inundated. Older residents reported witnessing the entire area south of Alakanuk, from the mouth of the Black River to Kusilvak Mountain, under water. An oil spill under these conditions would not remain localized, but potentially be spread over an area of several hundred square miles. Residents wondered if oil developers had plans for dealing with cleanup over such a large area.

Ocean Currents

Several residents expressed doubts that scientists understood the complex currents of Norton Sound in order to predict the danger of oil land falls. As an example, a group of Kotlik hunters became adrift on ice several years ago; from Kotlik, they drifted to within sight of Nome, reversed, and drifted southeast, eventually making a landfall on Stuart Island. This indicated to them that currents in Norton Sound did not move solely in one direction. Oil caught within these complex currents might be transported in unpredicted directions.

Cleanup

The Kwikpagmiut questioned whether oil could be adequately cleaned up from the tundra of the delta. To their minds, oil absorbed by tundra would be continuously released into the riverine systems over a long time period, with negative impacts on vital fish species such as sheefish, Bering cisco, broad whitefish, and salmon smelt. Burning oil-impregnated tundra as a cleanup measure was considered an absurd solution, a mark of the ignorance and insensitivity of the oil developers toward the regional ecology.

"Risks Without Benefits"

To certain respondents oil development in Norton Sound made the Kwikpagmiut assume substantial risks without the prospects of accruing any benefits. These residents questioned whether any benefits would be derived from oil development for the local people, such as royalty income to local communities and employment opportunities suited to the skills and cultural needs of residents. Other residents believed some system of damage payments should be instituted to provide restitution to the local people in the event of environmental and resource damage.

Negative Acculturative Impacts

Of concern to many interviewed residents was the prospect of socially negative outside influences entering the local communities. Increased alcohol and substance abuse frequently were mentioned as results of

interaction between local residents and seasonally employed outsiders. Others recognized the increase in alcohol and substance abuse to be symptomatic of' more subtle, stressful changes created by the uncontrolled contact with outsiders. Rapid culture changes in value orientations, aspirations, and goals were viewed as negative consequences of increased contact. The central issue appeared to be what measures would exist to insulate rural communities from the negative influences of outside, seasonal workers.

Cultural Survival

There were some residents on the Yukon delta who placed the issue of oil development within a higher conceptual framework. Tc them, the central issue was the survival of cultural groups.

From this perspective, the people of the Yukon delta were viewed as having developed over a span of several thousand years a unique and viable culture, a culture that had successfully adapted to severe challenges imposed from its surroundings. As a culture, it had successfully entered the modern historic era, adapting to a wide variety of new external conditions. Despite periods of severe epidemics, it had maintained its population levels. In response to new political and religious climates, it made internal adjustments in social organization and beliefs. As a group, these people had never suffered military defeat, but had maintained a sense of identity and personal control. Their relationship to the lands and seas upon which they have depended for survival had never been disrupted or dispossessed. As innovative

fishermen and hunters, they had incorporated new technologies to increase the efficiency of their fishing and hunting economies. Over the past century, they had integrated easily into an external market economy. In the chronicles of Native American cultures, the history of the peoples of the Yukon delta was a story of successful adaptation. Currently, the way of life on the Yukon delta was prospering in the modern era.

Could this unique way of life continue to coexist with others in the modern era? To some residents, offshore oil development raised the question by potentially pitting one culture against another. Simply stated, the conflict was this: The Kwikpagmiut and Tapraqmiut of the Yukon delta based their cultural survival upon the continued use of local food resources of the land and sea. The urban, industrialized economies outside the Yukon delta based their existence upon the use of petroleum products. Oil development thus symbolized a conflict between cultures at the level of essential resources. The development of oil which might benefit one way of life could destroy another by destroying its essential resources. The petroleum which has helped perpetuate the historical development of one culture, in the process of extraction, could curtail the historical development of another.

When viewed this way, the issue of petroleum development becomes translated into higher social and ethical questions. It becomes an issue of the rights of survival of two groups of people and two ways of life.

To the Kwikpagmiut and Tapraqmiut, there was no doubt about answering the ethical question. From their perspective the cultures of the Yukon delta, their own cultures, provided a way of life full of value and meaning. It had been, and could continue to be, a good way of life for the Yukon delta people. To their minds, the culture should survive. Of course, knowing so intimately their own way of life, their assessment could be no other. Accordingly, if oil development threatened the very basis of the culture by threatening its land and sea resources, then, to these groups, there should be no oil development. The Kwikpagmiut and Tapraqmiut would seek to preserve their culture, even at the risk of denying petroleum to outside cultural systems.

During the summer of 1981, certain residents of the Yukon delta spoke about oil with a quiet kind of disappointment and resignation. The cultures of the Yukon delta speared so small in comparison with all the cultures outside, they reasoned. It seemed inevitable that the interests of large groups would win out over the interests of so small a group of people.

There were others, however, who expressed a quiet hope and optimism. The cultures of the Yukon delta had successfully endured and prospered over thousands of years. Such strong cultures could be expected to continue to survive in the future. Reasonably, some equitable and just solution to the oil issue could be found.

BIBLIOGRAPHY

Alaska Department of Fish and Game. 1980. Annual Management Report. Yukon Area. Anchorage, Alaska. 146 pp.

Balikci, Asen. 1970. The Netsilik Eskimo. Natural History Press, Garden City, New York. 264 pp.

Burch, Ernest S. 1975. Eskimo Kinsmen. West, St. Paul.

Ellana, Linda J. 1980. Bering-Norton petroleum development scenarios and sociocultural impacts analysis, Volume I. Technical Report Number 54. Alaska OCS, BLM, Anchorage, AK. 455 pp.

Ellana, Linda J. 1980. Bering-Norton petroleum development scenarios. Sociocultural systems analysis, Volume II. Technical Report Number 54. Alaska OCS, BLM, Anchorage, AK, 251 pp.

Johnson, Allen W. 1978. Quantification in cultural anthropology. Stanford University Press, Stanford, CA. 231 pp.

Lantis, Margaret. 1946. The social culture of the Nunivak Eskimo. " Transactions of the American Philosophical Society, ns. Vol. 35, Pt. 3, 153-323.

Leaf, Murray J. 1972. Information and behavior in a Sikh village: Social organization reconsidered. University of California Press, Berkeley, CA. 296 pp.

Murdock, George Peter. 1949. Social structure. Macmillan, New York.

Oswalt, Wendell H. 1967. Alaskan Eskimos. Chandler Publishing Company, Sanfrancisco, CA. 297 pp.

Pennoyer, Steven, Kenneth R. Middlemton, and Melvan E. Morris, Jr. 1965. Arctic-Yukon-Kuskokwim Area Salmon Fishing History. Alaska Department of Fish and Game, Information Leaflet No. 70, Anchorage, AK. 51 pp.

Ray, Dorothy Jean. 1964. Nineteenth century settlement and subsistence patterns in Bering Strait. Arctic Anthropology. 2(2):61-94.

Schusky, Ernest L. 1972. Manual for kinship analysis. 2nd Edition. Holt, Rinehart and Winston, New York. 99 Pp.

Wolfe, Robert J. 1979. Food production in a Western Eskimo population. Ph.D. Dissertation in Anthropology, University of California, Los Angeles. 302 pp.

Zagoskin, Lavrentii Alekseevich. 1967. Lieutenant Zagoskin's travels in Russian America, 1842-1844. Edited by Henry N. Michael. University of Toronto Press, Toronto.

APPENDIX A

Glossary of Terms for Selected Food Species Utilized on the Yukon Delta or Stebbins

English	Scientific	Local Terms
Arctic grayling	Thymallus arcticus	chulukbowuk tuluqpak
Arctic lamprey	Lampetra japonica	ngumugiyuq ngumugazuq
Alaska whitefish Lake whitefish	Coregonus nelsoni Coregonus clupeaformis	chinekłiq nuqiya (small ones) nuqłiq
Belukha (white whale)	Delphinapterus leucas	st'oaq (or istoaq) munduq--belukha epidermis
Bering cisco	Coregonus laurettae	imuqbinruq small whitefish
Blackfish	Dallia pectoralis	ima'ngaq chun'geq
Broad whitefish	Coregonus nasus	kaurtuq nuqiyak (small) kaurkiachalguq (small)
Burbot	Lots iota	maniginuk lush
Dolly varden	Salvelinus malma	egathluqbiaq
Duck (generic)		ootgaq
Least cisco	Coregonus sardinella	etuleaq
Northern pike	Esox lucius	qusulik chuqfuk k'shuliq
Pacific herring	Clupea harengus	egauthluk'biq egauthloauk 'buq kaultuk--herring eggs on kelp

English	Scientific	Local Terms
Round whitefish	Prosopium cylindraceum	kassiaq nuqiyaq
Saffron cod	Eleginusgracilis	egauthluk egauthloaug
Chum (dog) salmon	Oncorhynchus keta	kanyetnuq kamiknuk nulkbiq oqoqliq (fall chum) okokliq (fall chum)
Coho (silver) salmon	Oncorhynchus kisutch	kaukiuq oqokliq kugge'yuk
King (chinook) salmon	Oncorhynchus tshawytscha	dogiuqfug chiuktuk chaqilukfuk
Pink (humpback) salmon	Oncorhynchus gorbuscha	chulqbuq juqbuq humpies
Salmon, salmon eggs, fermented		imlauq
Salmon, color turned or hook nosed		daliyuk
Salmon, easy drying		kaukezuk
Sandhill crane	Grus canadensis	ngutraq
Sculpin		
Slimy sculpin	Cottus cognatus	kiyokobauq
Coastrange sculpin	Cottus aleuticus	kanaufbuk
Prickly sculpin	Cottus asper	bullheads devil fish Irish lords

English	Scientific	Local Terms
Seal		
Bearded seal	Erignathus barbatus	mukluk--generic term alemeguk--adults oogeruk--adults (Stebbins) muklasuq--small mukluk ammirtaq--less than a year old angiyoktiq--adolescent
Ring seal	Pusa hispida	niyiq
Spotted seal	Phoca vitulina	ezo ' riq
Sheefish	Stenodus leucichthys	cheliq cheuq
Smelt		
Pond smelt	Hypomesus olidus	kozout
Rainbow smelt	Osmerus mordax dentex	chiqaulk kozioq chevokoliq
Snowshoe hare	Lupus americanns	makaquq
Starry flounder	Platichthys stellatus	nautakanuk nat'honuk
Swan (generic)		nguguyuq
Three spine sticklebacks	Gasterosteus aculeatus	koahulq needlefish
Trout (generic)	Salmo sp.	chuluqpauq egauthlukbuq
Willow ptarmigan	Lagopus lagopus	akazereaq

APPENDIX B

RESOURCE CONVERSION FACTORS

Resource	Dressed Weight
Seal, bearded	140.0
spot ted	56.0
ringed, fall	46.0
ringed, winter	63.0
Belukha	700.0
Walrus	560.0
Salmon, king	15.9
chum	4.9
coho	4.8
Sheefish, coastal communities	8.0
Mountain Village	5.5
Broad whitefish	
coastal communities	2.0
Mountain Village	4.0
Small whitefish	.75
Saffron cod	.75
Herring	.4
Burbot	4.5"
Pike	2.3
Ducks	1.5
Geese	5.0
Crane	10.0
Swan	10.0
Moose	715.0
Hare, arctic	5.0
snowshoe	2.5
Beaver	15.0
Otter	3.0
Muskrat	.75
Mink	2.0
Ptarmigan	1.0